



Corporate Safety Manual

Rev 6.0.1

Copyright © 2017 J. F. Electric, Incorporated. All rights reserved

Acknowledgement of Receipt

I HEREBY ACKNOWLEDGE RECEIPT OF THE

J. F. Electric, Inc. Corporate Safety Manual

I understand that it is my responsibility to become familiar with and abide by these guidelines, insofar as they apply to the duties which I shall perform for J. F. Electric, Incorporated.

Signature

Print Name

Date

Acknowledgment of the Alcohol and Controlled Substance Policy and Procedure

J. F. Electric, Inc. has an Alcohol and Controlled Substance Policy and Procedure that is in accordance with the Department of Transportation Regulations 49 CFR Part 40, 382 & 383. This portion of the policy applies to all CDL drivers of the Company. It is not intended as a contract and should not be so construed. In addition, this policy remains subject to change by The Company from time to time.

A copy of the Policy and Procedure has been provided and explained to me; therefore it is my responsibility to read the Policy statement prior to signing this acknowledgment form.

By signing this form I acknowledge that I have read the above, had the opportunity to ask questions, and that I have been given a copy of the Alcohol and Controlled Substance Abuse Policy and Procedure.

Employee Signature

Printed Name

Date

Witness Signature

Printed Name

Date

Mission Statement

J.F. Electric, Inc. strives to be a well-managed and diversified electrical services contractor providing a high quality and safety conscious work force allowing for a mutually rewarding relationship between our employees and owners, while maintaining an environmental friendly stewardship.

Corporate Safety Philosophy

J. F. Electric's greatest responsibility and highest value is to provide a safe and productive workplace for our employees. Good safety practices are good business practices.

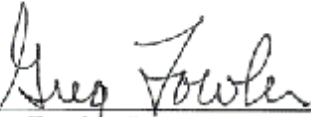
Our goal is to achieve zero incidents and injuries. To accomplish this, management will continually maintain and upgrade safety and property protection programs for our employees and owners.

Safety is every employee's right. No employee can be expected to work in unsafe conditions. Employees should report all safety and health hazards to their supervisor. The supervisor shall immediately notify the Safety Department for corrective action.

Safety is also every employee's responsibility. We enforce compliance with safety rules and industry accepted safe work best practices. Disciplinary action is taken where employees flagrantly or repeatedly violate safety rules. Employees are directly responsible and accountable for safety in the workplace.

To reinforce our commitment to safety, training shall be an ongoing part of every employee's job. Employees shall be empowered with the personal initiative and common sense approaches to confront the safety concerns of our industry. Every employee shall also be empowered to stop a job for any unsafe situation that they may encounter.

J. F. Electric's safety philosophy encompasses all members of our organization, and requires the total commitment of every employee as we work toward our goals.



Greg Fowler, P.E.
President

Safety Manual Overview

The safety manual is organized into the following three sections:

1. All Departments
2. Utility Line Department
3. Inside Department

All Departments: This is the general section of the safety manual. These policies and procedures apply to all employees of J. F. Electric, Inc. including mechanics, drivers and office.

Utility Line Department: This section is in addition to the All Departments section. It details policies and procedures that pertain specifically to outside Utility linemen.

Inside Department: This section is in addition to the All Departments section. It details policies and procedures that pertain specifically to inside wiremen (electricians)

Table of Contents

Acknowledgement of Receipt.....	3
Acknowledgment of the Alcohol and Controlled Substance Policy and Procedure.....	5
Mission Statement	7
Corporate Safety Philosophy	9
Safety Manual Overview.....	11
Table of Contents.....	13
Section I: All Departments	23
Safety Policy and Responsibilities.....	23
President, Vice Presidents, Department and Operations Managers.....	23
Project Managers and General Foremen.....	23
Foremen.....	24
Safety Representatives	24
Employees.....	25
Employee Training	26
New Employee Orientation	26
Employees.....	26
General Foremen and Foremen.....	27
Vice Presidents, Department Managers, Operations Managers, and Project Managers	27
Safety Meetings	27
Tool Box Safety Meeting Record Sheet	28
Recordkeeping	29
Incident/Near Miss Reports.....	29
Employee Access to Medical Records.....	29
Tools and Equipment – Portable.....	30
Extension Cord Sets	30
Flexible Cords and Cables	30
Manual Hand Tools.....	30
Power Hand Tools.....	30

Powder/Gas Actuated Tools	31
Chain Saw Safety	32
Company Vehicles	33
Vehicle Use Agreement	33
Review of Motor Vehicle Record	34
Traffic Violations	34
Preventable Motor Vehicle Accidents	34
Vehicle Idle Purpose / Policy:	35
Purpose	35
Background	35
Policy	35
Safe Driving Practices	36
Speed and Following Distance	36
Proper Lane Changing Techniques	36
Proper Passing Techniques	37
Precautions at Intersections	37
Driving on Interstate Highways and Freeways	37
Proper Backing Procedures	38
Proper Turning Techniques	38
Poor Weather Techniques	38
Protection Against Vehicle Theft	38
Parking Company Vehicles at Job Site	39
Precautionary Measures	39
Hand-Held Cell Phones While Driving	40
ATV/UTV Safety	40
Operations	40
Protective Gear:	40
Roll-Over Protection and Seat Belts:	41
Loading and Unloading the ATV :	41
Confined Spaces	42
OSHA Mandates for Confined Spaces	42
Confined Space Policy	42
Confined Space Requirements	43

Personnel Duties and Responsibilities.....	44
Authorized Supervisor	44
Authorized Attendant	44
Authorized Entrant.....	45
Categorizing Work Spaces Flowchart	46
Confined/Enclosed Space Entry Permit	47
GFCI Grounding Program	48
Ground-Fault Circuit Interrupters.....	48
Daily Visual Inspection	48
Temporary Electric.....	48
Temporary Wiring.....	48
Temporary Lighting.....	48
Temporary Power	48
Identification/Tagging.....	49
Electrical Safety (Unqualified).....	49
Protective Equipment Requirements	49
General Safety Related Work Practices	49
Working on Parts that have been placed in Electrically Safe Work Conditions	50
Re-Energizing Equipment.....	52
Working on Energized Parts.....	52
Working on Electrical Equipment less than 50 Volts.....	52
Vehicular and Mechanical Equipment	53
Illumination of Electrical Working Area.....	53
Confined / Enclosed Space Work.....	54
Conductive Materials and Equipment	54
Portable Ladders.....	54
Conductive Apparel.....	54
Housekeeping Duties	54
Interlocks.....	54
Use of and Handling of Portable Electric Equipment	54
Electric Power and Lighting Circuits.....	55
Use of Protective Equipment	56
Personal Protective Equipment	56

General Protective Equipment and Tools.....	56
Protective Shields, Protective Barriers or Insulating Materials.....	56
Alerting Techniques	57
Barricades	57
Attendants	57
Fire Prevention and Protection Policy	58
Storage and Use of Flammable and Combustible Materials	58
Burning, Welding and Cutting.....	58
Temporary Heating	59
Fire Suppression Equipment	59
Emergency Access.....	59
Training	59
Portable Fire Extinguisher Maintenance	59
Fire Protection	60
Portable Firefighting Equipment.....	60
Housekeeping Policy	61
Ergonomics Program.....	62
Ladders, Elevated Work Places and Floor Openings.....	63
Definitions.....	63
Procedures	64
Ladder Safety	64
Scaffolding and Elevated Working Platform Safety.....	65
Floor Openings.....	65
Personal Fall Arrest Systems.....	65
Personal Protective Equipment	66
Head and Eye Protection	66
Eye and Face Protection	66
Hearing Protection.....	66
Permissible Noise Exposure	67
Footwear Protection.....	67
PPE Training	68
PPE Assessment Matrix.....	69
Lockout/Tagout Program.....	70

Warehouse / Yard Personnel	72
Personal Protective Equipment	72
Tools and Equipment	72
Material Handling and Storage	72
Garage/Shop Personnel	73
General Safety	73
Maintenance Operations	74
Environmental	74
Vehicle Operation	74
Machine Guarding	74
Lifting Devices	74
Jacks	75
Wheel and Tire Maintenance	75
Welding in Garage – General Precautions	77
Radiator Maintenance	78
Fuel Tank Repairs	78
Drug and Alcohol Free Workplace Policy	81
Prohibitions	81
Authorized Use Of Prescribed Medicine	82
Drug and Alcohol Awareness Program	82
Disciplinary Actions	83
Testing	84
Types of Testing	84
Confidentiality	85
Aberrant Behavior Checklist	87
Supervisor Training/Education	89
Employee Safety Recommendation Program	89
Employee Safety Recommendation Form	90
Subcontractor Safety Policy	91
Subcontractor Evaluation Criteria	91
Safety Performance Data Responses	91
Risk Management/Insurance Data	92
Subcontractor Prequalification Safety Evaluation Form	93

Risk Management/ Insurance Data	97
Disciplinary Policy	98
Environmental Compliance Policy	99
Spill Prevention and Response.....	99
Waste Management	99
Construction Activities.....	99
General.....	99
Spill Prevention and Response.....	100
Waste Management	100
Construction Activities.....	100
Training	100
Hazard Communication/Globally Harmonized System	101
Bloodborne Pathogens	104
Medical Services, First Aid and CPR.....	104
Process Safety Management Program.....	105
Wireless Communication Devices (WCDs) While Working	106
Office Safety.....	107
Computer Use Ergonomics	107
Section II: Utility Line Department	109
Internal Reporting Procedure: Personal Injury/Vehicle/ Property/Near Miss.....	109
Utility Line Department Daily Job Briefings.....	110
Utility Company Information Exchange.....	110
Personal Protective Equipment (PPE).....	112
Utility Line Department Disciplinary Policy	114
Cranes and Other Lifting Equipment	115
Heavy Equipment.....	115
Hand Signals.....	115
Operators Responsibilities	117
Additional Requirements.....	117
Rigging.....	118
Critical Lift Plan	118
Objective:.....	118
Critical Lift Plan Form.....	120

Capacity Chart Guideline	123
Traffic Control at Work Sites.....	125
Minimum Requirements.....	125
Flaggers.....	125
Cones.....	125
Truck Warning Lights	125
Traffic Signs.....	125
High Voltage/Utility Work.....	126
General Requirements.....	126
Alternating Current – Minimum Approach Distances	128
Rubber Goods	129
Rubber Gloves and Rubber Sleeves.....	129
Rubber Line Hose, Insulator Hoods, Blankets, etc.....	130
Live Line Tools.....	130
Power Hand Tools.....	131
Pole Climbing Equipment.....	131
Climbers and Climbing Practices.....	131
Mechanical Equipment	132
General.....	132
Aerial Lifts and Derricks	132
Cranes and other lifting equipment.....	134
Material Handling	134
Grounding for Protection of Employees.....	135
Overhead Construction.....	135
Wire Pull Safety Check List.....	139
Construction in Energized Substations.....	140
Substation & Relay.....	141
Underground Construction.....	149
Excavations: Hazard Recognition in Trenching and Shoring.....	151
Introduction	151
Definitions.....	151
Overview: Soil Mechanics.....	152
.....	152

Determination of Soil Type	155
Test Equipment and Methods for Evaluating Soil Type.....	155
Shoring Types.....	157
Shielding Types	158
Sloping and Benching.....	159
Spoil.....	161
Special Health and Safety Considerations	162
Excavation Checklist.....	164
Bore Construction.....	165
Underground Facility Damage Procedure	166
<i>Section III: Inside Department</i>	167
Internal Reporting Procedure: Personal Injury/Vehicle/ Property/Near Miss.....	167
Inside Department Disciplinary Policy	168
Cranes, Derricks and Heavy Equipment.....	169
Responsibilities	169
Employees.....	170
Inspections	170
Rigging and Sling Inspections and Safety Requirements.....	171
Operational Procedures.....	172
Pre-use Inspection	172
Safe Work Practices	172
Rigging a Load	173
Moving a Load.....	174
Parking a Crane or Hoist	174
Working at heights on cranes or hoists	174
Hand Signals.....	174
Hand Signal Chart.....	175
Heavy Equipment.....	176
High Voltage/Utility Work.....	176
Personal Protective Equipment Policy.....	177
Hazard Assessments	177
Hard Hats	177
Eye and Face Protection	177

Hearing Protection.....	177
Foot Protection.....	177
Clothing.....	178
Fall Protection.....	178
Hand Protection.....	178
Training.....	179
Respirator Program.....	179
Equipment.....	179
Fitness.....	179
Training.....	179
Sanitation and Maintenance.....	180
Surveillance and Monitoring.....	180
Effectiveness.....	180
Fall Protection Plan.....	180
Personal Fall Arrest System (PFAS).....	180
Training.....	181
Incident Review.....	182
Energized Electrical Work Safety Program.....	182
Policy.....	182
Purpose.....	182
Scope.....	182
Definitions.....	182
Requirements.....	184
Hazard Control.....	185
Engineering Controls.....	185
Administrative Controls.....	186
Protective Equipment.....	186
Energized Work Procedures.....	187
Hazard Analysis Procedure.....	188
Reference Material.....	188
J.F. Electric Energized Electrical Work Permit.....	189
Electrical Safety (Qualified).....	190
Qualified Persons.....	190

Approach Distances for Qualified Person(s) (alternating current)	191
General Safety Related Work Practices	192
Working on or Near Exposed De-Energized Parts	193
Re-Energizing Equipment.....	194
Working on or Near Energized Parts	195
Working on Electrical Equipment 50 Volts or Less	195
Vehicular and Mechanical Equipment	195
Illumination of Electrical Working Area.....	196
Confined Space Work.....	196
Conductive Materials and Equipment	196
Portable Ladders	196
Conductive Apparel.....	197
Housekeeping Duties	197
Interlocks.....	197
Use of and Handling of Portable Electric Equipment	197
Electric Power and Lighting Circuits.....	198
Test Instrument and Equipment	198
Use of Protective Equipment	199
Tower Safety	200
Fall Protection.....	200
Tower Rescue.....	202
RF/EME Safety.....	203

Section I: All Departments

Safety Policy and Responsibilities

It is the policy of J. F. Electric, Inc. to provide a healthy and safe work environment for all employees, meeting or exceeding the requirements and standards established by federal, state and local regulations.

We will comply with all codes, standards, and industry accepted safe work practices as they apply to our operations, including safety regulations which are set forth in federal, state, and local statutes, as well as electrical industry standards. Additional safety guidelines of individual owners and/or utilities where J.F. Electric, Inc. will perform work shall also be enforced.

We will integrate safe work habits into every aspect of our company's activities. Managers and supervision at all levels shall be held responsible and accountable for maintaining maximum safety performance and incident prevention. Employees shall be held responsible and accountable for performing their job assignments in the most safe, efficient, and productive manner possible.

President, Vice Presidents, Department and Operations Managers

1. Establish the policies and standards in matters of safety.
2. Review the performance of all Managers, General Foremen and Foremen on a regular basis with regard to those policies and standards.
3. Commit the necessary resources to provide Managers, General Foremen and Foremen the means with which to properly perform their jobs with regard to corporate safety policies and standards.
4. Strictly enforce corporate safety and disciplinary policies at all levels.
5. Require subcontractor's compliance with all federal, state, and local safety regulations, including safety programs of the owner and J. F. Electric, Inc.
6. Require all vendors and equipment dealers to comply with all regulations with regard to purchasing material and the purchasing or rental of equipment.
7. Lead by example.

Project Managers and General Foremen

1. Assume responsibility for site safety, communicating all corporate safety policies and performance standards to field personnel.
2. Strictly enforce corporate safety and disciplinary policies at all levels.
3. Plan the work in such a way as to minimize the possibility of injury, property damage or other events that could have an adverse impact on the company or its owners.

4. Inspect projects on a regular basis for the purpose of detecting unsafe conditions and/or actions and implement corrective actions as necessary. All inspections shall be documented on company form.
5. Monitor the safety practices of other firms on the job site. Document violations and communicate with management immediately.
6. Assist the Safety Department to develop a site specific safety and training program.
7. Lead by example.

Foremen

1. Lead by example by initiating and following good safety work practices and guidelines. Promote safety as the #1 priority. Instruct those reporting to you about safe work practices and that safety is their responsibility.
2. As the competent person, ensure the entire safety program is carried out at the work level and strictly enforce the safety and disciplinary policies. Address all unsafe behavior you observe immediately.
3. Assist the Safety Department to develop site specific and pertinent topics for toolbox talks.
4. Inspect the job site daily, ensuring against unsafe conditions or employee actions, and instituting corrective actions immediately. This includes notifying crew of the nearest medical facilities and location of job site first aid kits and fire extinguishers. All inspections shall be documented on company forms.
5. Conduct and document weekly toolbox safety meetings and daily job briefings
6. See that necessary personal protective equipment (PPE) is on the job site, being used, and properly maintained.

Safety Representatives

1. Stay current with new standards and regulations, and assist management in formulating new safety policies and guidelines to achieve safety performance goals and total compliance with federal, state and local regulations.
2. Maintain a complete file of all safety related activities. Work related injury and illness forms shall be maintained for 5 years.
3. Develop and maintain a safety reference library.
4. Develop and maintain a stock of safety forms and supplies.
5. Develop and maintain a stock of safety training material, both video and written, and assist management with the implementation of safety training programs.
6. Assist in the investigation of all incidents, review reports for completion and accuracy, and provide support for developing and implementation of corrective action.
7. Maintain and distribute OSHA records and reports.
8. Perform and document inspections of job sites, equipment and company facilities for the purpose of identifying deficiencies and assisting management in developing corrective solutions.
9. Assist management and employees with safety related information and applicable regulatory revisions.

10. Lead by example.

Employees

1. Comply with federal, state and local laws, along with company and owner safety policies, guidelines, and safe work practices. Violations are subject to disciplinary action.
2. Refrain from unsafe acts that will endanger themselves or fellow workers.
3. Assist in correcting and reporting unsafe acts and conditions
4. Use and maintain all personal protective equipment and safety devices provided. Report any PPE and safety device deficiencies, immediately.
5. Report all incidents, injuries and near misses immediately.
6. Encourage co-workers to work safely.

Employee Training

All J. F. Electric, Inc. employees shall be educated to recognize the hazards they or their subordinates may encounter in the workplace, consistent with their individual responsibilities, including:

1. Actions appropriate to eliminate or control workplace hazards
2. Safety guidelines and work practices
3. Site specific owner/general contractor requirements
4. Federal, state and local regulations related to the task

An employee shall receive additional training (or retraining) under any of the following conditions:

1. If the supervision or inspections indicate that the employee is not complying with the safety-related work practices required by this section.
2. If new technology new types of equipment, or changes in procedures necessitate the use of safety-related work practices that are different from those which the employee would normally use.
3. If he or she must employ safety-related work practices that are not normally used during his or her regular job duties.

New Employee Orientation

All new employees of J. F. Electric, Inc. shall be trained with regard to safety and health prior to receiving a job assignment. New hire orientation shall consist of:

1. A general review of the J. F. Electric, Inc. Safety Manual, including the Drug & Alcohol Free Workplace Policy.
2. A copy of the NECA Employee Safety Handbook (Inside Department only).
3. A copy of OSHA Safety & Health Standards - Digest for Electrical Construction Workers (Inside Department only).
4. Company and owners policies regarding safety meetings, injury reporting, personal protective equipment, safety rules and employee conduct.
5. Information on HazCom/GHS and Safety Data Sheets.

If an employee leaves the company for more than 30 days, the employee is required to repeat New Employee Orientation and pre-employment drug test.

A signed Safety Manual Acknowledgment of Receipt shall be kept in the employee's file.

Employees

All employees are required to attend regularly weekly toolbox safety meetings held at the job site, as well as any special safety meeting specifically related to their work.

Topics may include hazard recognition, special permit requirements, HazCom/GHS, confined spaces, etc. Employees are encouraged to attend outside safety programs such as those offered by their local union, and may be required to attend classes offered by NECA, SIBA, COCA,

MSHA, OSHA and owners. At no time shall employees perform tasks in which they have not been trained.

General Foremen and Foremen

All General Foremen and Foremen shall become thoroughly familiar with the contents of the J. F. Electric, Inc. Safety Manual and with the safety policies and requirements of the owner. The General Foremen and Foreman are responsible for informing all new employees of the hazards associated with the job location and type of work to be performed. Foremen shall also conduct weekly toolbox safety meetings and be required to conduct daily job briefings prior to the start of work.

All General Foremen and Foremen shall become familiar with the applicable standards, and are encouraged to attend safety programs made available by their local unions. At times, Foremen shall be required to attend outside safety programs such as those offered by NECA, SIBA, COCA, MSHA, OSHA and owner.

Vice Presidents, Department Managers, Operations Managers, and Project Managers

Vice Presidents, Department Managers, Operations Managers, and Project Managers are required to become thoroughly familiar with the contents of the J. F. Electric, Inc. Safety Manual, owner safety policies and applicable standards. All Managers shall be required to attend outside safety programs.

Safety Meetings

A weekly safety meeting shall be held at each J. F. Electric, Inc. job site. These meetings shall be conducted by the General Foreman, Foreman, a Safety Representative, or a member of management and shall cover the following topics:

- Work practices
- Safety and health issues
- Job hazards

Employee suggestions should be encouraged and employees with recommendations should fill out an Employee Safety Recommendation Form (see Employee Safety Recommendation Program).

The Safety Department shall provide some of the materials to be used at the weekly toolbox safety meeting, such as Power Talks, handouts or videos. Meetings shall be organized and to the point.

A record of each meeting shall be documented on a Tool Box Safety Meeting Record Sheet. Copies shall be kept at the project office for OSHA inspections, forwarded to the owner (if required), and forwarded to the Safety Department.

Tool Box Safety Meeting Record Sheet

Date: _____

Job Name: _____ Foreman: _____

Subject: _____

Materials: Video _____ Handout _____ Verbal _____ Written _____

Employee: Name (print)	Signature
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____
9. _____	_____
10. _____	_____
11. _____	_____
12. _____	_____
13. _____	_____
14. _____	_____
15. _____	_____

Recordkeeping

We are required by OSHA and other agencies to maintain accurate records of work-related injuries and illnesses. Employees are required to report all incidents, injuries, and near misses immediately. The company shall review and investigate each incident. This information is used to help prevent incidents of similar nature from reoccurring.

Incident/Near Miss Reports

The Safety Department shall provide incident forms and guidance to the General Foreman, Foremen and injured party during the incident investigation process. The Safety Department shall provide the Claims Department with the final incident reports.

Employee Access to Medical Records

Employees are allowed access to personal medical records in J. F. Electric's, Inc. possession resulting from special physicals, injuries, or occupational illnesses. Requests for copies must be addressed to the Safety Department, in writing. One copy of the records shall be provided to the employee or their designated representative at no cost.

Tools and Equipment – Portable

Unsafe tools and equipment create a danger to everyone. J. F. Electric's tools and equipment shall be maintained in safe working condition at all times. Damaged, malfunctioning or otherwise unsafe tools shall immediately be tagged and removed from service.

Extension Cord Sets

Extension cord sets used with portable electric tools and appliances shall be the three-prong wire type and designed for hard or extra-hard usage. All extension cord sets shall be marked with either: S, SC, SE, SJ, SO, or ST. (See National Electrical Code, Article 400, Table 400-4 for further designations on cords for hard or extra-hard usage.)

Flexible Cords and Cables

Flexible cords and cables shall be the three-prong wire type and designed for hard or extra-hard usage. Extension cord sets, flexible cords and cables shall be protected from damage. Sharp corners and projections should be avoided and protection provided at all potential pinch points. If the flexible cords and cables are unrepairable, they shall be tagged and taken out of service. Cords and cables may be spliced only if their service rating is Hard Service No. 12 or greater. The splice cord shall be tested to retain the original electrical and mechanical integrity of the cord.

Flexible cords shall be connected to devices and fittings which provide strain relief, preventing pull directly to the splices and terminal screws.

Extension cord sets or flexible cords and cables with missing grounding prongs shall be tagged and removed from service immediately.

Manual Hand Tools

All hand tools, whether provided by the company or the employee, shall be maintained in a safe condition. All hand tools shall be inspected daily. Damaged tools shall be removed from service immediately.

Pocket knives shall not be used on the job.

Power Hand Tools

All power driven tools, whether gasoline, diesel, electric, battery, compressed air or hydraulic shall be maintained in a safe condition in accordance with manufacturer recommendations. All electrical power tools shall be the three-prong wire type or double insulated. All guards, keepers, locks and other safety devices such as GFCIs shall be in place and used as intended by the manufacturer. Tools shall not be modified or altered.

Safe operating pressures for hydraulic and pneumatic tools, hoses, valves, pipes, filters, and fittings may not be exceeded.

A hydraulic or pneumatic tool used where it may contact exposed energized parts shall be designed and maintained for such use.

Operating manuals shall be available for all power hand tools. Foremen are responsible for ensuring employees are familiar with their operation and safety features of the tools. Damaged or defective power hand tools shall be tagged and removed from service immediately.

Powder/Gas Actuated Tools

Only authorized employees who possess a valid certificate of competence issued by the manufacturer shall be allowed to use powder/gas actuated tools.

Powder/gas actuated tools shall be maintained according to the manufacturer's recommendations. Repairs and/or adjustments shall only be made by an authorized service representative.

Powder/gas actuated tools shall be used in accordance with the manufacturer's recommendations.

Operators and their assistants using these tools shall wear eye and face protection, hearing protection in addition to the normal PPE.

Inspect tools before use to ensure that it is clean, that moving parts operate freely and the barrel is free from obstruction.

Follow the manufacturer's recommendations if a misfire occurs. Misfired cartridges shall be disposed of according to the manufacturers' recommendations.

Before operating a powder/gas actuated tool, clear the work area on all sides. Guards for protecting workers against a possible ricochet and/or warning signs may be necessary in the working area.

Never fire a powder/gas actuated tool in explosive or flammable environments.

Always ensure objects have no holes or openings and is structurally stable to prevent projectile from passing through

Chain Saw Safety

Before Starting to Saw:

- Check controls, chain tension, and all bolts and handles to ensure they are functioning properly and adjusted according to the manufacturer's instructions.
- Fuel the saw at least 10 feet from sources of ignition.

While Running the Saw:

- Keep hands on the handles, and maintain secure footing while operating the chainsaw.
- Clear the area of obstacles that might interfere with cutting the tree or using the retreat path.
- Do not cut directly overhead.
- Shut off or release throttle prior to retreating.
- Shut off or engage the chain brake whenever the saw is carried across hazardous terrain.
- Be prepared for kickback; use saws that reduce kickback danger (chain brakes, low kickback chains, guide bars, etc.).

Personal Protective Equipment Requirements:

- PPE shall be inspected prior to use on each work shift to ensure it is in serviceable condition.
- The following PPE shall be used:
 - Head Protection
 - Hearing Protection
 - Eye/Face Protection
 - Leg Protection (when being operated on the ground)
 - Foot Protection
 - Hand Protection

Company Vehicles

Vehicle Use Agreement

JF Electric, Inc. (hereinafter "JF Electric") maintains a fleet of vehicles for use in conducting official JF Electric business. All employees who operate JF Electric vehicles shall have a valid driver's license, and agree to the terms set forth below in this Vehicle Use Agreement (hereinafter "Agreement"). All commercial driver's license, renewals and CDL physicals shall be paid by the employee.

Authorized Use: The only use of JF Electric vehicle shall be for official JF Electric business or otherwise incidental use associated with official business away from the headquarters. Any other use, other than official JF Electric business, of a JF Electric vehicle is strictly prohibited. All passengers shall be designated and/or approved as employees involved in official JF Electric related business.

A JF Electric vehicle used to transport non-JF Electric employees is considered non-business use. The transportation of other personnel, such as, friends or family members for purposes not related to JF Electric business is strictly prohibited. The rationale of "convenience" is not a valid reason for dropping off friends, spouses, children, etc., in route to an approved destination. Thus, if an employee wishes to travel with his/her family, a personal vehicle should be used. This provision does not preclude family members or non-JF Electric employees involved in official JF Electric business and approved by JF Electric for traveling in a JF Electric vehicle.

Prohibited Uses:

- a) The use of a JF Electric vehicle by an employee who is under the influence of alcohol or drugs is prohibited. Any such vehicle use shall be grounds for disciplinary action up to and including dismissal.
- b) All drivers and passengers in JF Electric vehicles are required to wear seat belts.
- c) Modifications to JF Electric vehicles for personal reasons are not permitted. This includes affixing signs, stickers, antennas, bike racks, ski racks, window tinting, etc.
- d) Installation and/use of any radar detection device in JF Electric vehicles is prohibited.
- e) The use of JF Electric vehicles for personal gain, such as delivering goods or services is prohibited.
- f) Hitchhikers are not permitted in JF Electric vehicles, except in emergency situations when drivers are rendering assistance to disabled motorists. (Jump starts are not allowed except in emergency situations and then only to start JF Electric owned vehicles).

Adherence to Applicable Laws: Drivers of JF Electric vehicles shall abide by all motor vehicle laws in the State which the vehicle is being operated. Drivers are personally responsible for the cost of all traffic citations and parking tickets.

Damage and Injury: To the extent any JF Electric property, including a J.F. Electric vehicle, is damaged as a result of unauthorized use or inappropriate use as set forth in this agreement, the driver of such vehicle shall be responsible for the damages to the property. To the extent any third party incurs any damage to property or injury to person as a result of unauthorized or inappropriate use as set forth in this agreement, the driver of such vehicle shall be responsible for all damages resulting therefrom. The employee shall indemnify and hold harmless JF Electric for any damage to JF Electric property and/or damage or injury to person of a third party as a result of the unauthorized or inappropriate use of a JF Electric vehicle.

Review of Motor Vehicle Record

State Motor Vehicle Records (MVRs) shall be used as a source for verifying driver history. MVRs shall be obtained and reviewed at least annually for all employees who drive company owned, rented or leased commercial motor vehicles. Driving privileges may be withdrawn or suspended and/or the company vehicles removed for any authorized driver not complying with company policy. In addition, appropriate disciplinary action may be taken.

Driver Records and Corrective Action Personnel files shall include MVR, fleet accident histories, and corrective action documentation for employees who drive company vehicles.

Traffic Violations

Fines for parking or moving violations are the personal responsibility of the assigned operator. The company shall not condone nor excuse ignorance of traffic citations that result in court summons being directed to the owner of the vehicle.

Each driver is required to report all motor carrier violations to their supervisor within 24 hours. This requirement applies to violations involving the use of any company vehicle. Failure to report violations shall result in appropriate disciplinary action.

Traffic violations incurred during non-business (personal use) hours will affect the driver as well and are subject to review.

Preventable Motor Vehicle Accidents

A preventable motor vehicle accident is defined as any accident involving a company vehicle that results in property damage and/or personal injury, and in which the driver in question failed to exercise every reasonable precaution to prevent the accident.

Classification of preventable accidents:

- Following too close
- Driving too fast for conditions
- Failure to observe clearances
- Failure to obey signs
- Improper turns
- Failure to observe signals from other drivers

- Failure to reduce speed
- Improper parking
- Improper passing
- Failure to yield
- Improper backing
- Failure to obey traffic signals or directions
- Exceeding the posted speed limit
- Driving While Intoxicated (DWI) or Driving Under the Influence (DUI) or similar charges

Vehicle Idle Purpose / Policy:

Purpose

- This Policy is intended to protect the health of our workforce and community, improve air quality, conserve fuel and extend the lives of our equipment. J.F. Electric employees are directed to minimize idling time in all aspects of operations.

Background

- Within this policy, idling means allowing an engine to run while the motor vehicles PTO is not engaged or transmission is not engaged in forward or reverse motion.
- Idling vehicles and equipment degrade local air quality. Emissions from idling vehicles accumulate and can pose a health risk to employees and the community at large.
- Idling for more than 10 seconds uses more fuel than restarting the engine.
- Today's diesel engines are not designed to idle. Excess idling has damaged emission-related components on trucks and as a result has increased downtime and repair costs.

Policy

No unoccupied vehicle or engine may idle for more than 5 consecutive minutes. This limit applies to all J.F. Electric vehicles, unless the vehicle is idling for specific circumstances defined below:

- When the health and safety of employees or others may be jeopardized (e.g., due to weather conditions or when the visibility of the driver is impaired), vehicle operators will only idle a vehicle for the minimum amount of time needed to maintain visibility and an appropriate work environment inside the vehicle.
- When it is necessary to complete a function of the vehicle (e.g., hydraulic power, engaging power take off or warning lights and/or headlights).
- When warming a vehicle up to operating temperatures as specified by the equipment manufacturer (no more than 5 minutes).
- When it is necessary for servicing, testing, or maintenance.

No occupied diesel vehicle may idle for more than 30 consecutive minutes or more than 60 total minutes in any one day. This limit applies to all J.F. Electric vehicles, unless the vehicle is idling for specific circumstances defined below:

- When the health and safety of employees or others may be jeopardized (e.g., due to weather conditions or when the visibility of the driver is impaired), vehicle operators will only idle a vehicle for the minimum amount of time needed to maintain visibility and an appropriate work environment inside the vehicle.
- When it is necessary to complete a function of the vehicle (e.g., hydraulic power, engaging power take off or warning lights and/or headlights).
- When warming a vehicle up to operating temperatures as specified by the equipment manufacturer (no more than 5 minutes).
- When it is necessary for servicing, testing, or maintenance.

Safe Driving Practices

All company drivers shall drive in a safe professional manner at all times. Drivers shall follow safe driving procedures.

Speed and Following Distance

Most rear-end accidents occur when the trailing vehicle is following too close and/or going too fast. Make sure to maintain a two second to four second spacing (plus additional spacing for vehicle length and speed) interval between your vehicle and the vehicle in front of you.

Always drive at or below the posted speed limit. There may be times where speed should be adjusted due to the prevailing traffic flow. Safety shall always be the primary consideration.

Always comply with “advisory” speed limit warnings posted along construction sites, at congested intersections, etc.

When driving in inclement weather or when towing a heavy load, additional spacing should be allowed between your vehicle and the vehicle in front of yours. Speed should also be reduced.

Proper Lane Changing Techniques

Numerous accidents occur when drivers fail to use proper lane changing techniques. Ensure that you have sufficient time to make the lane change. When making a lane change, always check for vehicles approaching the intended lane or in the intended lane.

Always signal before making a lane change.

Do not depend on mirrors to detect vehicles traveling in your blind spot. Take a quick glance over your shoulder to check all blind spots before making a lane change. Not doing so is the primary cause of lane change accidents.

Make sure all rear view and side view mirrors are properly adjusted before beginning your trip.

Proper Passing Techniques

Always allow sufficient space in which to pass. Serious head-on collisions have occurred when the driver "thought" he/she had enough space to pass. When in doubt, DO NOT PASS.

Always use your turn signals to let drivers behind and in front know you are about to attempt a pass. Also use your signal before pulling back into the right hand lane.

Pass only where it is legal to pass when driving on a 2-lane road. DO NOT PASS on hills, curves, at intersections, on bridges, in no passing zones or where double yellow lines are present.

After passing a vehicle, ensure ample space before returning to the right lane.

Do not pass unless it is absolutely necessary.

Precautions at Intersections

Always reduce speed when approaching an intersection even if you have the green light or crossing traffic has a stop sign. Many accidents have occurred when the "other person" proceeded through a red light or ran a stop sign. Always be a defensive driver.

When your light turns green, do not immediately proceed into the intersection. Look both ways before entering the intersection even if you have the right-of-way. Confirm that all crossing traffic has come to a complete stop.

When two vehicles approach a four way stop sign at the same time, the automobile to your right has the right-of-way. If there is confusion, yield to the other driver.

If you observe a vehicle following closely behind you as you approach an intersection, tap your brake three or four times to make the other driver aware you are about to stop. This could prevent a rear-end collision.

If you are at an intersection waiting to make a left or right hand turn and the vehicle approaching you from the left has its turn signal on to turn right at the intersection, do not assume the other person will actually turn. Do not proceed until the other vehicle is making his turn.

Driving on Interstate Highways and Freeways

Always drive at or below the posted speed limit.

When merging onto a multi-lane interstate, signal prior to merging and use the entrance ramp to pick up speed allowing you to enter traffic at the same speed as the traffic flow. DO NOT stop at the end of the entrance ramp and wait for traffic to clear.

Do not assume vehicles traveling in the right lane will move over, allowing you to merge into traffic. Look for a space as you approach the lane.

If there is a vehicle in front of you on an entrance ramp, continuously move your eyes from the side mirror to the vehicle in front. DO NOT disregard the vehicle directly in front of you. Many times vehicles will slow down and sometimes come to a complete stop on the entrance ramp, resulting in a rear-end collision.

When exiting an interstate, use your turn signal and exit at the same speed as the traffic flow.

If you happen to drive past your intended exit, do not backup along the shoulder of the interstate. Continue on to the next exit.

Proper Backing Procedures

Avoid backing up whenever possible. When available, use a spotter to direct your backing. The spotter can be any JF Electric employee in the vicinity. Before backing vehicle, walk around the vehicle to check for any objects in your path. Never assume your path is clear. Do not depend on rear view and side view mirrors to detect objects in the path of your vehicle.

Proper Turning Techniques

Make every effort to be in the turning lane 200 to 300 feet prior to the intersection. Many accidents occur when drivers make a last second decision to make a turn.

Drivers shall signal well in advance of the turn. Most state laws require a driver to signal at least 100 feet before making a turn. Be extremely careful not to signal for your turn if, before reaching your intended turn, there is another street or driveway where you can turn. There have been numerous accidents when drivers thought the vehicle was going to turn before reaching them, but instead proceeded into or through the intersection.

Poor Weather Techniques

During snow and rain storms, drivers should increase following distance an additional four seconds. When pulling heavy loads or driving a heavy class vehicle, increase the following distance up to eight seconds.

During or after snow and rain storms, reduce speed well in advance of intersections, interstate ramps and other areas where vehicles merge.

During inclement weather (rain, fog, etc.) reduce overall speed to compensate for poor road conditions and visual impairment. Numerous accidents have occurred due to hydroplaning as a result of driving too fast for existing road conditions.

Protection Against Vehicle Theft

Always lock your vehicle and take the keys with you. Make sure all windows are closed securely.

Do not leave valuables visible in your vehicle. Put them where they cannot be observed, but do so before you park so you will not be observed storing the valuables.

Park in well-lit and fenced areas when possible. Cars: At home, park in the driveway, or better yet in a locked garage. Avoid parking on the street. Trucks: Park in secured areas when possible, and park close to each other (bin-to-bin) to make it more difficult to break into the side bins.

To make a vehicle more difficult to steal, turn wheels sharply to the right or left. With front-wheel drive vehicles, use the emergency brake and put the vehicle in park to lock all four wheels.

If your vehicle is equipped with an anti-theft device, use it. Visible devices may discourage thieves.

Do not leave your driver's license or vehicle registration card in your vehicle. If the vehicle is stolen, these documents can be used to steal your identity.

Do not leave anything in the vehicle with your address on it. It may invite home burglary.

Do not discuss your destination, cargo contents, or other information with non-company personnel.

Parking Company Vehicles at Job Site

Always park trucks in the safest possible location to avoid exposure to hazards of moving traffic and where possible to afford protection to employees and avoid backing.

When parking a vehicle the driver shall take care to prevent unintentional movement of the vehicle. The parking brake shall be set on all parked vehicles. Vehicles with dual wheels shall utilize appropriate wheel chocks.

Precautionary Measures

Vehicle equipment shall be in safe operating condition. Brakes, lights, signals, tires, horn and mirrors shall be checked daily. (Written inspection)

Tailgates should be in closed position, except when loading and unloading, or when the length of the load requires otherwise. Loads extending more than 2 feet but less than 4 feet from the vehicle shall be marked with a red flag. Loads shall not be allowed to extend more than 4 feet.

Employees shall not ride on the exterior of vehicles. The cab of a vehicle can accommodate no more than the number of seat belts provided.

Vehicles shall not be overloaded. Load weights shall not exceed the manufacturers' recommendations.

Do not exceed maximum GVW, front or rear axle capacity.

Do not exceed overall truck height.

Hand-Held Cell Phones While Driving

JF Electric, Inc. is committed to the safe operation of motor vehicles. Accordingly, the only communication devices that shall be used while driving are hands free.

For the purpose of this document, these devices include: wireless phones, computers, PDAs, navigation devices and other information or entertainment services and/or devices, whether or not such devices are provided by JF Electric, Inc.

The following rules apply:

- As a driver, your first responsibility is to pay attention to the road.
- When it is safe to do so, pull to the side of the road and stop before using a non-hands free device.
- Allow voicemail to answer incoming calls on non-hands free devices.
- Learn to use device features that will reduce distraction such as automatic redial, voice dial or memory dial.
- Text messaging and E-mailing shall not be performed while driving.

ATV/UTV Safety

The following information is to provide safe operating procedures when operating All Terrain Vehicles (ATVs) and Utility Terrain Vehicles (UTVs) by JF Electric, Inc. employees in the performance of their jobs. This covers the use of 4 wheelers, with or without roll bars and seat belts, and the use of snowmobiles.

All of the above listed machines will be referred to as "ATV" throughout this document.

Operations

- The driver shall follow all manufacturer's safe operating recommendations.
- Horseplay or trick riding shall not be permitted.

Protective Gear:

The following PPE shall be worn when operating an ATV:

- Motorcycle helmet- DOT approved
- Eye protection
- Boots
- Gloves
- Long pants

Roll-Over Protection and Seat Belts:

- When roll over protection and seat belts are provided, seat belts shall be worn when the vehicle is in motion.
- If roll over protection and seat belts are provided on the ATV, a motorcycle helmet is not required. An approved hard hat shall be worn while operating or riding on/in the vehicle. All other additional PPE listed above still apply.

Loading and Unloading the ATV :

- The towing vehicle shall be turned off, placed in park, the parking brake set and the wheels chocked (if applicable) when loading or unloading an ATV.
- If hauling an ATV on a trailer, the trailer shall be attached to the towing vehicle during the loading and unloading process.
- Sturdy ramps shall be used during the loading and unloading of all ATVs.
- Special care shall be taken while loading and unloading an ATV, directing attention to the correct placement of the ramps.
- When muddy or icy conditions are present during loading and unloading procedures, the operator must be aware that slippery conditions make the chance of an accident much more likely. Take necessary steps to eliminate these hazards,

The operator shall have a working communication device (cell phone) available and with them at all times, in case of an emergency.

Confined Spaces

J. F. Electric, Inc. employees required to work in non-permit required confined spaces, (entry team members, attendants, and rescue teams), shall be trained by the Safety Department or designated representatives, and equipped to work without risk of injury or illness. The employee, Foreman and others in the area of a confined space are jointly responsible for safe entry, safe work practices and possible rescue.

OSHA Mandates for Confined Spaces

1. Hazard Recognition
 - a) Hazardous atmosphere
 - b) Engulfment potential
 - c) Extreme temperatures
 - d) Elevated noise levels
 - e) Slick or wet surfaces
 - f) Falling objects
2. Ventilation
3. Isolation
 - a) Blinding or blanking off lines
 - b) Secure electrical and other energy sources by following established Lockout/Tagout procedures
 - c) Communicate and document to necessary persons that confined space work is being performed.
4. Protective Equipment

Confined Space Policy

A *confined space* is defined as an area which:

1. Has adequate size and configuration for employee entry.
2. Has limited means of access or egress.
3. Is not designed for continuous employee occupancy.

A *permit required confined space* is defined as a confined space that has one or more of the following characteristics:

1. Contains or has a known potential to contain a hazardous atmosphere
2. Contains or has the potential to contain a material with the potential for engulfing an entrant
3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor which slopes downward and tapers to a smaller cross section
4. Contains any other recognized serious safety or health hazard

A *non-permit required confined space* is a confined space that with respect to atmospheric hazards does not contain or have the potential to contain any hazard capable of causing death or serious physical harm. Note: non-permit areas require a separate permit to burn or weld.

It is the responsibility of the owner or host employer to identify and provide contractors all necessary information concerning:

1. Permit required confined spaces
2. Non-permit required confined spaces
3. Permit system and procedures in use
4. All likely hazards associated with the confined space that may be encountered

Regardless of confined space classification, all atmospheric testing results are to be recorded on a Confined/Enclosed Space Entry Permit form.

All spaces identified as a confined space shall be classified according to hazard potential.

Permitted confined spaces shall be divided into Class A and Class B.

1. Class A - High Hazard Potential - requires a permit, atmospheric testing, continuous atmospheric monitoring, retrieval and extraction equipment, communication equipment, fire extinguishers, and a rescue team available. J. F. Electric, Inc. will consider Class A confined space entries as a special circumstance. No entry will be allowed into Class A confined spaces until special equipment and training are available.
2. Class B - Low Hazard Potential - requires a permit for atmospheric testing, retrieval equipment, communication equipment, fire extinguisher, and a Dedicated Observer.
3. Non-Permit Confined Space - requires a permit, atmospheric testing, retrieval equipment, communication equipment, and periodic monitoring.

The guidelines in this policy shall apply to all identified confined spaces. Examples of confined spaces shall include, but not be limited to the following:

1. Tanks, pits, vaults, vessels, excavations or other confined spaces with one side open to the air, four feet (4') deep or greater.
2. Manholes, sewers, utility tunnels, ventilation or exhaust ducts, culverts, and pipelines.

Confined Space Requirements

1. Prior to entering a confined space the Foreman shall hold a pre-entry meeting.
Topics to be discussed:
 - a) Hazard associated with the particular confined space
 - b) Permit requirement
 - c) Personnel duties
 - d) Personal Protective Equipment
 - e) Communication plan and backup
 - f) Retrieval guidelines
 2. Prior to entering a confined space, the Foreman shall determine that the atmosphere is safe by testing with a calibrated 4-gas monitor and documenting results on the permit.
 3. Air monitoring shall be conducted at different elevations, the minimum being every 4' in elevation. Air monitoring shall be conducted in the following order:
 - a) Oxygen deficiency/enrichment
 - b) Flammable levels
 - c) Toxic levels
-

- d) Particulates - visibility 5' or less
4. When a hazardous atmosphere is detected, the work area shall be ventilated by forced air ventilation until a safe atmosphere has been assured by additional tests.
 5. The Foreman shall ensure there is an adequate continuous supply of air into all vaults and manholes.
 6. Confined space entrants shall wear a full body harness attached to a mechanical retrieval device or lifeline attached to a fixed point outside the space, allowing immediate removal, with an attendant present, while work is being performed.
 7. If at any time during occupancy, the atmospheric testing equipment indicates an alarm or any other hazard, immediately exit the space, then secure the space to prevent others from entering.

Personnel Duties and Responsibilities

Authorized Supervisor

1. Be familiar with the space and any hazards therein.
2. Ensure zero energy using lockout/tagout procedures.
3. Ensure atmospheric monitoring.
4. Ensure Confined Space Permit is completed, posted and returned upon completion of entry.
5. Ensure all involved employees are trained.
6. Check and enforce Personal Protective Equipment requirements.
7. Verify that rescue systems and notifications are in place.
8. Verify that the communications plan is in place, with backup.
9. Know all potential exposure symptoms.
10. Ensure space is returned to proper condition.

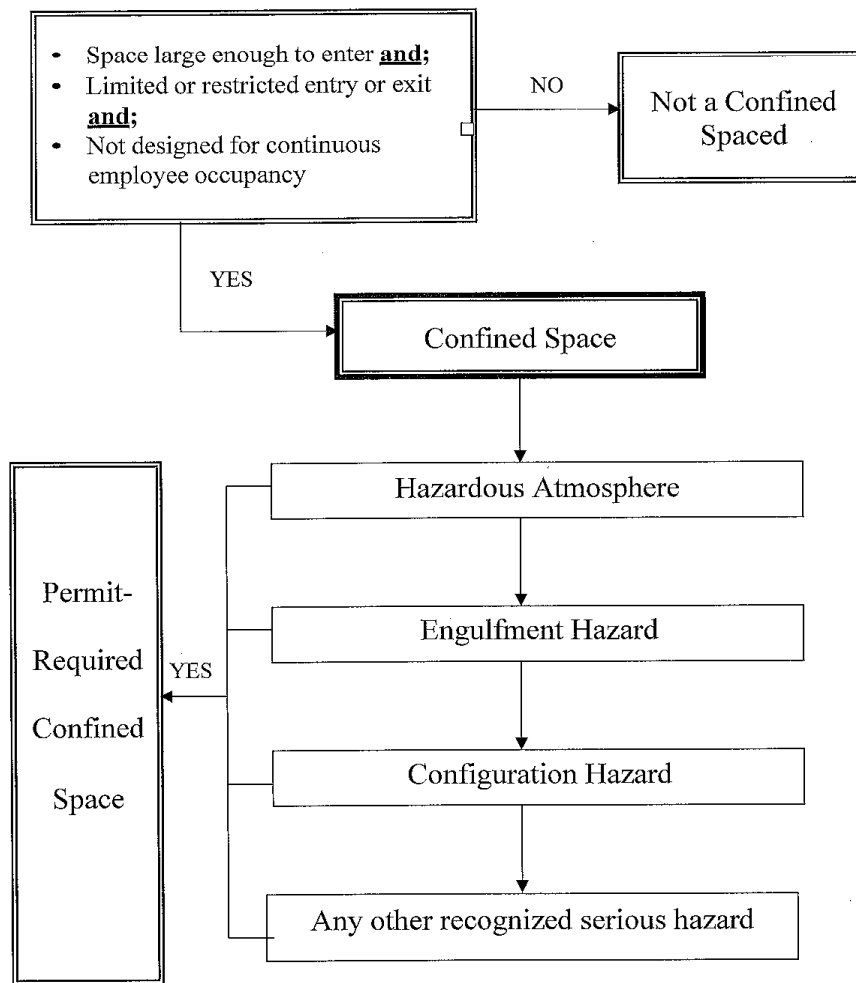
Authorized Attendant

1. Be familiar with space and any hazards therein.
2. Only qualified personnel are allowed to enter confined space with proper PPE and equipment.
3. Monitor activities inside and outside of the confined space.
4. Knows all potential exposure symptoms.
5. Conduct atmospheric monitoring as required.
6. Know the communications plan and backup.
7. Barricade the area and keep unauthorized people clear.
8. Know emergency rescue procedures.
9. Review permits and signs upon completion of space-specific training.
10. Post Confined Space Entry Permit at entry and record required information on permit as needed during entry
11. Return the entry permit paperwork to the Edwardsville office for filing. Documents shall be kept for one (1) year.

Authorized Entrant

1. Be familiar with the space and any hazards therein.
2. Know the work to be performed, the tools required, and any physical or logistical limitations.
3. Know all potential exposure symptoms.
4. Conduct atmospheric monitoring as required.
5. Know the communications plan and backup.
6. Know emergency rescue procedures.
7. Evacuate upon changes in conditions, symptoms, attendant orders, etc.
8. Reviews the entry permit and sign upon completion of space-specific training

Categorizing Work Spaces Flowchart



Confined/Enclosed Space Entry Permit

Confined/Enclosed Space Entry Permit

Permit Required

Non-Permit Required

Location & Description of Confined Space:

Purpose of Entry:

Scheduled Start _____ a.m. _____ p.m.	Scheduled Finish _____ a.m. _____ p.m.
Day / Date / Time	Day / Date / Time

Employee(s) in charge of entry: _____

Entrants:

Attendants:

Pre-Entry Authorization:

{Check those items below which are applicable to your confined space permit.}

TYPES OF HAZARDS

- | | | |
|--|---|---|
| <input type="checkbox"/> Oxygen-Deficient Atmosphere | <input type="checkbox"/> Engulfment | <input type="checkbox"/> Energized Electrical Equipment |
| <input type="checkbox"/> Oxygen-Enriched Atmosphere | <input type="checkbox"/> Toxic Atmosphere | <input type="checkbox"/> Entrapment |
| <input type="checkbox"/> Welding/Cutting | <input type="checkbox"/> Flammable Atmosphere | <input type="checkbox"/> Hazardous Chemical |

Note: If welding/cutting operations are to be performed, attach additional information.

SAFETY PRECAUTIONS

- | | | |
|---|---|---|
| <input type="checkbox"/> Self-Contained Breathing Apparatus | <input type="checkbox"/> Protective Gloves | <input type="checkbox"/> Barricade Job Area |
| <input type="checkbox"/> Air-Line Respirator | <input type="checkbox"/> Lifelines | <input type="checkbox"/> Signs Posted |
| <input type="checkbox"/> Fire-Retardant Clothing | <input type="checkbox"/> Respirators | <input type="checkbox"/> Clearances Secured |
| <input type="checkbox"/> Ventilation | <input type="checkbox"/> Lockout/Tagout | <input type="checkbox"/> Lighting |
| <input type="checkbox"/> Remarks _____ | <input type="checkbox"/> Fire Extinguishers | <input type="checkbox"/> Ground Fault Interrupter |

ENVIRONMENTAL CONDITIONS

TESTS TO BE TAKEN	DATE / TIME	RE-TESTING	DATE / TIME
Oxygen: _____ %	_____ a/p	Oxygen: _____ %	_____ a/p
Lower Explosive Limit: _____ %	_____ a/p	Lower Explosive Limit: _____ %	_____ a/p
Toxic Atmosphere: _____		Toxic Atmosphere: _____	
Instruments Used: _____		Instruments Used: _____	

Employee Conducting Safety Checks SIGNATURE: _____

Remark on the overall condition of the confined space.

ENTRY AUTHORIZATION	ENTRY CANCELLATION
All actions and/or conditions for safe entry have been performed.	Entry has been completed and all entrants have exited permit space.
Person in Charge of Entry (print) _____	Person in Charge of Entry (print) _____
Signature: _____	Signature: _____

In Case of Emergency Call 911

GFCI Grounding Program

Ground-Fault Circuit Interrupters

J. F. Electric, Inc. shall provide approved ground-fault circuit interrupters (GFCI) for all 120 Volt, Single Phase, 15 and 20 ampere receptacle outlets on construction sites, which are not part of the permanent wiring of the building or structure, and which are in use by employees.

If a receptacle or receptacles are installed as part of the permanent wiring of the building or structures, and used for temporary electrical power, GFCI protection for JF Electric, Inc. personnel shall be provided.

Daily Visual Inspection

Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall be tagged and removed from service.

Temporary Electric

Temporary Wiring

All temporary wiring shall be in compliance with OSHA, 29 CFR 1926.405 and the National Electrical Code, Article 305.

Temporary Lighting

Temporary Lighting shall be adequate for the work being performed. All temporary lighting shall have GFCI protection, if required. Temporary lighting shall be maintained at the minimum levels in all work areas throughout the job.

Temporary lights shall not be suspended by their electric cords, unless designed for that purpose.

All lamps shall be protected from accidental contact or breakage, and the metal case socket shall be grounded.

Temporary Power

All GFCIs installed on temporary construction wiring shall be tested monthly, and documented (temporary services and temporary receptacle boards).

Identification/Tagging

Communication is critical for temporary electrical installations. The installation of a temporary electrical supply shall be identified and tagged at the source, area, and/or device supplied.

Electrical Safety (Unqualified)

The training requirements contained in this section apply to employees who face a risk of electric shock that is not reduced to a safe level.

Protective Equipment Requirements

- Dielectric hard hat (Class E)
- FR/AR Clothing
- Rubber gloves with leather protectors
- Protective shields, barriers or insulating material
- Insulated tools and handling equipment
- Fuse handling equipment for the system voltage
- Safety glasses with side shields
- Appropriate rated hood and/or face shield

Additionally employees who are considered unqualified but are covered by this section shall be trained in and be familiar with any electrically related safety practices not specifically addressed in this section but are necessary for their safety.

General Safety Related Work Practices

1. Energized parts to which an employee may be exposed SHALL be placed in an electrically safe work condition before working on or near them.
 - a) If placing the parts in an electrically safe work condition introduces additional or increased hazards or is infeasible due to equipment design or operational limitations, the energized parts need not be placed in an electrically safe work condition. This applies only to the following:
 - i. Interruptions of life support equipment,
 - ii. Deactivation of emergency alarm systems,
 - iii. Shutdown of hazard location ventilation equipment,
 - iv. Removal of illumination for an area,
 - v. Infeasibility due to the equipment design or operational limitations, including testing of electrical circuits that can only be performed with the circuit energized, and work on circuits that form an integral part of a continuous industrial process in a chemical plant that would be otherwise needed to be completely shut down in order to perform work on one circuit or piece of equipment.
2. If the exposed energized parts are not placed in an electrically safe work condition (for reasons of increased or additional hazards or infeasibility) other safety related work

practices to protect against contact of energized circuit parts directly with any part of the body or indirectly through some other conductive object SHALL be used. The work practices used shall be suitable for the conditions under which the work is performed and for the voltage level of the exposed electric conductors or circuit parts. Note: Jurisdictional work rules regarding staffing and equipment requirements for work on energized equipment shall be followed.

3. Only Qualified Person(s) (those trained to distinguish exposed energized parts from other parts of electrical equipment, have the ability to determine the nominal voltage of the energized parts and whom are knowledgeable of the clearance and approach distance) can work on energized electrical equipment. These personnel shall be capable of working safely on energized circuits and shall be familiar with the proper use of precautionary techniques, personal protective equipment, insulating and shielding material and insulated tools.
4. If work is to be performed near overhead lines, the lines shall be de-energized and grounded or other protective measures shall be provided before work is started. If the lines are to be de-energized, arrangements shall be made with the host employer/owner to de-energize and ground the line. If protective measures such as guarding, isolating or insulating are provided, these precautions shall prevent employees from contacting such lines directly with any part of their bodies or indirectly through conductive materials, tools or equipment.
5. When an unqualified person or persons (those not trained to distinguish exposed energized parts from other parts of electrical equipment, to determine the nominal voltage of the energized parts and to determine safe working clearances and approach distances) work in an elevated position near overhead lines the location shall be such that the person or persons and the longest conductive object the person may come into contact with cannot come closer to any unguarded, energized overhead line than the following distances:
 - 20 ft. for voltages below 50 kv.
 - 20 ft. plus 4 inches for every 10 kv over 50 kv
6. Unqualified personnel working on the ground in the vicinity of overhead lines cannot bring any conductive object closer than:
 - 20 ft. from unguarded, energized overhead lines of voltage of 50 kv or less, or
 - Closer than 20 ft. plus 4 inches for every 10 kv over 50 kv.
7. Where flammable materials are present only occasionally, electric equipment capable of igniting them shall not be used unless measures are taken to prevent hazardous conditions from developing. Such material includes but not limited to: flammable gases, vapors or liquids; combustible dust; and ignitable fibers or fillings.

Working on Parts that have been placed in Electrically Safe Work Conditions

1. This applies to work on exposed parts that have been placed in electrically safe work condition or near enough to them to expose the employee to any electrical hazard the parts may present

- a) Conductors and parts of electric equipment that have been de-energized, but have not been locked out or tagged shall be treated as energized parts and all work procedures and precautions used and followed when working on energized parts shall be followed.
 - b) While any employee is exposed to contact with parts of fixed electrical equipment or circuits, which have been de-energized, the circuits energizing the parts shall be locked out or tagged or both in accordance with the Lockout/Tagout procedure.
2. De-energizing equipment
- a) Safe procedures for de-energizing circuits and equipment shall be determined before circuits or equipment are de-energized.
 - b) The circuit and equipment to be worked on shall be disconnected from all electrical energy sources. Control circuit devices such as push buttons, selector switches and interlocks shall not be used as the sole means of de-energizing the circuits or equipment. Interlocks for electrical equipment shall not be used as a substitute for locking and tagging procedures. Always stand to one side when de-energizing circuits or equipment.
 - c) Stored electric energy which might endanger personnel shall be release. Capacitors shall be grounded and high capacitance elements shall be short-circuited and grounded if the stored energy might endanger personnel. (If the capacitors or associated equipment are handled while releasing energy, they SHALL be treated as energized and all procedures and precautions for handling energized equipment shall be followed).
 - d) Stored non-electrical energy in devices that could re-energize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not accidentally energize the device.
 - e) A lock and tag shall be placed on each disconnecting means used to de-energize circuits and equipment on which work is to be performed. The lock shall be attached so as to prevent personnel from operating the disconnecting means unless undue force is used.
 - f) Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.
 - g) If a lock cannot be applied and it can be demonstrated that tagging procedures provide a level of safety equivalent to that obtained by use of a lock, then a tag may be used without a lock. (A tag used without a lock shall be supplemented by a least one additional safety measure that provides a level of safety equivalent to that obtained by use of a lock. Example: Removal of an isolating circuit element; blocking of a controlling switch or opening an extra disconnecting device).
 - h) Before working on de-energized circuits or equipment, a Qualified Person shall operate the equipment or otherwise verify that the circuit or equipment cannot be re-energized or started. The Qualified Person shall use test equipment to test the circuit elements and electrical parts of the

equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back feed even though the specific parts of the circuit tested is over 600 volts, nominal, the test equipment shall be checked for proper operation before and after the circuit is tested.

Re-Energizing Equipment

These requirements shall be met, in the order given before circuits or equipment are re-energized, even temporarily:

1. A Qualified Person shall conduct the test and make visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds and other such devices have been removed, so that the circuit or equipment can be safely energized.
2. Employees exposed to the hazards associate with re-energizing the circuit or equipment shall be warned to stand clear of the circuit and equipment.
3. Each lock and tag shall be removed by the employee who applied it or under the employee's direct supervision. (If the employee is absent from the work place, the lock and tag may be removed by a Qualified Person after exhausting efforts to contact the person and after making a complete inspection (with the appropriate supervisors) to ensure the equipment is safe to re-energize. The employee shall be made aware that the tag and lock have been removed, upon their return to work.
4. Before re-energizing any circuits or equipment, there shall be a visual determination made to ensure that all employees are clear of the circuit or equipment.
5. When re-energizing circuits or equipment stand to one side when operating switches.

Working on Energized Parts

These requirements shall be met, in order to work on exposed energized parts involving either direct contact or contact by means of tools or materials, and any work done near enough to exposed energized parts, for employees to be exposed to any hazard they present.

1. Only a Qualified Person shall work on electrical circuit parts or equipment that has not been placed in an electrically safe work condition. Such persons shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding material and insulated tools, and shall use these measures.
2. If work is to be performed near overhead lines, the lines shall be de-energized and grounded, or other protective measures shall be provided before work is started. Refer to clearances stated previously.
3. For voltage normally encountered with overhead power lines, objects which do not have an insulating rating for the voltage involved, are considered to be conductive.

Working on Electrical Equipment less than 50 Volts

This procedure is to cover the work on equipment and electrical systems operating less than 50 volts to ground.

1. Equipment and electrical systems operating less than 50 volts shall be tested for actual voltage before work begins.
2. Employees working on equipment or systems operating less than 50 volts are not exposed to an electrical shock hazard.
3. Equipment and electrical systems operating at less than 50 volts shall be locked or tagged out if a hazard of a remote starting of the equipment exists.
4. If the power supply to equipment or electrical systems operating at less than 50 volts is greater than 1,000 volts-amps the equipment shall be treated as a potential arc flash hazard.

Vehicular and Mechanical Equipment

1. An electrical Unqualified Operator of a vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 20 feet is maintained.
2. If the vehicle is in transit with its structure lowered the clearance may be reduced to 4 ft. If the voltage is higher than 50 kv the clearance shall be increased by 4 inches for every 10 kv above 50 kv.
3. If insulating barriers are installed to prevent contact with the line, and if the barriers are rated for the voltage of the line being guarded and are not part of or an attachment of the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.
4. If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a Qualified Person, the clearance between the insulated portion of the aerial lift and the power line may be reduced to the minimum approach distance for a Qualified Person.
5. Employees standing on the ground shall not contact the vehicle or mechanical equipment or any of the structure that provides a conductive path to the employee on the ground. Barricades and warning signs or vehicle grounds shall be used.
6. If any vehicle or mechanical equipment capable of having parts of its structure elevated near an energized overhead line is intentionally grounded, employees working on the ground near the point of grounding shall not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on the earth resistivity and fault currents, which can develop with the first few feet or more outward from the grounding point.

Illumination of Electrical Working Area

1. Do not enter spaces containing exposed energized parts unless illumination is provided that enables you to perform work safely.
2. Where lack of illumination or an obstruction precludes observation of the work to be performed, do not perform task near exposed energized parts.
3. Do not reach blindly into area which contain energize parts.

Confined / Enclosed Space Work

1. When working in a confined / enclosed space that contains exposed energized parts, install and use protective shields, protective barriers or insulating material as necessary to prevent unintentional contact with the energized parts
2. Secure doors, hinged panels, etc. to prevent them from swinging into someone and causing contact with exposed energized parts.

Conductive Materials and Equipment

Conductive materials and equipment that are or may come in contact with any part of the body shall be handled in a manner that will prevent contact to exposed energized conductors or circuit parts.

Take precautions to insulate or guard energized parts to minimize the hazard and use deliberate, slow material handling techniques as well as non-conductive personal protection.

Portable Ladders

Use only portable ladders with non-conductive side rails, if used where the ladder could contact exposed energized parts.

Conductive Apparel

Do not wear conductive materials such as rings, bracelets, watches, watch bands, key chains, metalized aprons; clothing with conductive thread or metal head protection when working on or near exposed energized parts.

Housekeeping Duties

1. Where energized parts present an electrical contact hazard do not perform housekeeping duties until insulating equipment or barriers are installed to prevent contact when working close to the energized parts.
2. Do not use electrically conductive cleaning materials in proximity to energized parts unless insulating equipment or barriers have been installed. (Electrically conductive cleaning materials include steel wool, metalized cloth and silicon carbide, as well as conductive liquid solutions).

Interlocks

1. Only a Qualified Person, after taking special precautionary procedures, using personal protective equipment and insulating or shielding material and using insulated tools, is allowed to defeat an electrical safety interlock and then only temporarily while working on the equipment.
2. The interlock system shall be returned to its operable condition when the work is completed.

Use of and Handling of Portable Electric Equipment

The following rules apply to cord and plug connected equipment, including extension cords.

1. Handle portable equipment in a manner which will not cause damage.
2. Never use flexible electric cords connected to equipment to raise or lower the equipment.
3. Do not fasten flexible cords with staples or otherwise hang cords in such a fashion as could damage the outer jacket or insulation, unless specifically designed for this purpose.
4. Visually inspect portable cord and plug connected equipment and flexible cord sets (extension cords) before any use for loose parts, deformed and/or missing pins, damage to outer jacket or insulation and for evidence of possible internal damage, such as, pinched or crushed outer jacket. Cord and plug connected equipment and extension cords which remain connected, once put in place and which are not exposed to damage, need not be visually inspected again until relocated.
5. Do not use cord and plug connected equipment or extension cords which show a defect or evidence of damage that might expose employee to injury. Remove the defective material from service and tag it with a danger tag or discard the material. It shall not be re-used until repairs and testing renders it safe for re- use.
6. When attaching a plug to a receptacle, including extension cords, check first to make sure that both the plug and receptacle are of the same configurations.
7. Flexible cords used with grounding type equipment shall contain an equipment grounding conductor. Attachment plug and receptacles shall not be connected or altered in any manner that would prevent proper continuity of the equipment grounding conductor at the point where the plug is attached to the receptacle. These devices shall not be altered to allow the grounding prong of a plug to be inserted into slots intended for connection to the current carrying conductors. Adapters which interrupt the continuity of the equipment grounding connection shall not be used.
8. Portable electric equipment and extension cords used in highly conductive work locations or in job locations where employees are likely to contact water or conductive liquids shall be approved for those locations. (Highly conductive work locations include those contained with water or other conductive liquids).
9. Hands and gloves shall be dry when plugging and unplugging energized flexible cords or cord and plug connected equipment.
10. Locking type connectors shall be properly secured after connection.

Electric Power and Lighting Circuits

Routine opening and closing of circuits

1. Load rated switches, circuit breakers or other devices specifically designed as disconnecting means shall be used for the opening, reversing or closing of circuits under load conditions.
2. Cable connectors not of the load break type, fuse, terminal lugs and cable splice connections shall not be used to open or close circuits, except in emergencies.
3. After a circuit is de-energized by a circuit protection device, the circuit shall not be manually re-energized until it has been determined that the equipment and circuit can be safely re-energized.

4. Repetitive manual re-closing of a circuit breaker or re-energizing circuits through the replacement of fuse is prohibited.
5. When it can be determined from the design of the circuit and over-current device involved that the automatic operation of a device was caused by an overload rather than a fault condition, an examination of the circuit or connected equipment is unnecessary before re-energizing.
6. Over-current protection of circuits and conductors shall not be modified, even on a temporary basis beyond that allowed by the installation safety requirement for over-current protection.

Use of Protective Equipment

Personal Protective Equipment

1. Employees working in the area where there are potential electrical hazards SHALL be provided with, and shall use, electrical protective equipment that is appropriate for the specific part(s) of the body to be protected and for the work to be performed.
2. Electrical protective equipment shall be maintained in a safe, reliable condition and shall be inspected before use and tested as required.
3. If the insulating capability of electrical protective equipment may be subject to damage during use, the insulating material shall be protected. Leather protectors SHALL be used to protect rubber gloves.
4. Employees shall wear non-conductive head protection.

General Protective Equipment and Tools

1. When working near exposed energized conductors or circuit parts, each employee shall be isolated or insulated if the tools or equipment could come within the minimum approach distance. If the insulating capability of insulated tools or handling equipment is subject to damage, the insulating material shall be protected.
2. Fuse pulling equipment, insulated for the circuit voltage, shall be used to remove or install fuses when the fuse terminals are energized.
3. Ropes and hand-lines used near exposed energized parts shall be non-conductive.

Protective Shields, Protective Barriers or Insulating Materials

1. Protective shields, protective barriers or insulating material shall be used to protect each employee from shock, burns or other electrical related injuries while those employees are working on or near exposed energized parts which might be accidentally contacted or where dangerous electric heating or arcing might occur.
2. When normally enclosed energized parts are exposed for maintenance or repair, the parts shall be guarded to protect unqualified persons from contact with the energized parts.

Alerting Techniques

Safety signs, safety symbols or accident prevention tags shall be used where necessary to warn employees about electrical hazards which may endanger them and to protect employees from shock, burns or failure of the electrical equipment.

Barricades

Barricades shall be used in connection with safety signs where it is necessary to prevent or limit access to work areas which could expose unqualified persons to un-insulated energized conductors, equipment or circuit parts. Conductive barricades shall not be used where they might cause an electrical contact hazard.

Attendants

If signs or barricades do not provide sufficient warning and protection from electrical hazards, an attendant shall be stationed to warn and protect unqualified persons.

Fire Prevention and Protection Policy

Prevention of fires is one of the most important safety responsibilities in the construction industry.

Storage and Use of Flammable and Combustible Materials

Flammable materials, including but not limited to gasoline, diesel fuel, propane, and solvents shall always be stored outside of building areas. Storage areas shall be well marked with "Flammable" and "No Smoking" signs, and containers shall be marked with their actual contents. Storage areas shall be kept clear of trash, debris, and combustible materials, as well as any sources of heat or sparks. All flammable liquids exceeding five (5) gallons shall be stored in a containment area capable of holding the material in the event of a leak, spill or rupture. Fire extinguishers shall be kept within 25 feet of storage areas.

Flammable and combustible liquids (such as gasoline) shall be handled in approved, labeled metal safety cans. The use of flammable products such as gasoline for cleaning and degreasing is prohibited. Use only approved solvents for this purpose.

Oily rags or rags contaminated with flammable and/or combustible material shall be placed in approved, rated covered metal containers provided for that purpose.

Combustible materials, such as cardboard boxes, wood, plastics, and rubber goods should be stored neatly, with room between stacks in areas either outside of occupied buildings or in areas where automatic fire protection is available. Combustible trash shall be removed from work areas every day.

Burning, Welding and Cutting

In some work situations, permit systems have been initiated for all types of hot work. Permit systems provide independent checks and regulation of work methods which might cause a fire hazard. In permit-only hot work situations, no hot work shall be allowed until permits are approved and delivered to the work location. Persons found performing hot work without a permit shall be subject to disciplinary action.

Where permits are not required for hot work, extreme caution is required. If possible, objects involved in hot work should be moved to a safe location before the work begins. If the objects cannot be relocated, positive means to confine the heat, sparks, and slag shall be taken. Fire blankets or other suitable barrier material shall be placed between the hot work and the adjacent structures or personnel. Fire extinguishers or an approved extinguishing agent shall be available at all flame producing operations. In some cases, a non-working Fire Watch may be required. Persons acting Fire Watch shall be thoroughly familiar with the emergency procedures established for that work area.

Fire Watch shall maintain visual contact with the hot work site for at least 30 minutes after work is completed.

Temporary Heating

On most job sites, temporary heating is within the general contractor's scope of work. If J. F. Electric, Inc. is required to provide temporary heating, the following standards shall apply:

1. Self-contained, portable, fully enclosed units are preferred. All units shall be inspected to be in safe working order before being placed on the job site.
2. Temporary heating units of the fuel burning variety shall be in safe working order and equipped with tip-over and flame-out switches. Closed flame type units are required.
3. All temporary heaters shall be set up on non-combustible surfaces, and shall have a minimum of five feet (5') of clearance to the nearest combustible object in all directions.
4. Extra fuel for heaters shall be stored outside the building. Burning barrels, buckets, or open fires are strictly prohibited.

Fire Suppression Equipment

Every project shall maintain a supply of fire extinguishers of the type which are suitable for the hazards involved. Fire extinguishers shall be kept in all job trailers and at easily accessible locations around the work area. All employees shall be familiar with the location and use of the fire extinguishers. A fire extinguisher shall be located at every flame producing operation. The Foreman shall check with the owner representative or general contractor to ascertain the availability and location of water supply lines, when appropriate.

Emergency Access

Access to all work areas shall be maintained at all times. Roadways, ladders, stairs, and walkways shall be kept free of debris and materials to allow ready access of emergency personnel and equipment.

Training

Employees shall be trained in general principles of fire extinguisher use and the hazards involved in incipient stage fire-fighting during orientation and at least annually.

Portable Fire Extinguisher Maintenance

All portable fire extinguishers shall be subjected to monthly visual inspections and an annual maintenance check. The annual maintenance date shall be retained for one year after the last entry, or for the life of the shell, whichever is less.



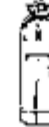












Fire Protection

Portable Firefighting Equipment

Fire extinguishers

1. A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of the protected building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 75 feet.
2. One or more fire extinguishers, rated not less than 2A, shall be provided on each floor. In multistory buildings, at least one fire extinguisher shall be located adjacent to stairway.
3. A fire extinguisher, rated not less than 10B, shall be provided within 25 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite. This requirement does not apply to the integral fuel tanks of motor vehicles.
4. Fire extinguishers shall be approved by a nationally recognized testing laboratory.

Table F-1 FIRE EXTINGUISHERS DATA

	WATER TYPE				FOAM	CARBON DIOXIDE	DRY CHEMICAL			
							SODIUM OR POTASSIUM BICARBONATE		MULT-PURPOSE ABC	
										
	STORED PRESSURE	CARTRIDGE OPERATED	WATER PUMP TANK	SODA ACID	FOAM	CO ₂	CARTRIDGE OPERATED	STORED PRESSURE	STORED PRESSURE	CARTRIDGE OPERATED
CLASS A FIRES WOOD, PAPER, TRASH HAVING GLOWING EMBERS 	YES	YES	YES	YES	YES	NO <small>(CERTIFIED CONTROL SURFACE FIRES)</small>	NO <small>(CERTIFIED CONTROL SURFACE FIRES)</small>	NO <small>(CERTIFIED CONTROL SURFACE FIRES)</small>	YES	YES
CLASS B FIRES FLAMMABLE LIQUIDS, GASOLINE, OIL, PAINTS, GREASE, ETC. 	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
CLASS C FIRES ELECTRICAL EQUIPMENT 	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
CLASS D FIRES COMBUSTIBLE METALS 	SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING									
METHOD OF OPERATION	PULL PIN, SQUEEZE HANDLE	TURN UPSIDE DOWN AND BUMP	PUMP HANDLE	TURN UPSIDE DOWN	TURN UPSIDE DOWN	PULL PIN, SQUEEZE LEVER	RUPTURE CARTRIDGE, SQUEEZE LEVER	PULL PIN, SQUEEZE HANDLE	PULL PIN, SQUEEZE HANDLE	RUPTURE CARTRIDGE, SQUEEZE LEVER
RANGE	30' - 40'	30' - 40'	30' - 40'	30' - 40'	30' - 40'	3' - 8'	5' - 30'	5' - 30'	5' - 30'	5' - 30'
MAINTENANCE	CHECK AIR PRESSURE GAUGE MONTHLY	WEIGH GAS CARTRIDGE AND FILL WITH WATER ANNUALLY	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY RECHARGE	DISCHARGE ANNUALLY RECHARGE	WEIGH SEMI-ANNUALLY	WEIGH GAS CARTRIDGE, CHECK CONDITION OF DRY CHEMICAL ANNUALLY	CHECK GAS PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	CHECK GAS PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	WEIGH GAS CARTRIDGE, CHECK CONDITION OF DRY CHEMICAL ANNUALLY

Housekeeping Policy

Good housekeeping is an important part of any safety program. A poor housekeeping program usually indicates poor or unsafe work habits. Good housekeeping is essential in the work place, as it reduces the probability of accidents resulting from tripping, slipping, falling, or fire. Each employee has the responsibility to maintain a clean and safe working environment.

1. All stairways, passageways, gangways, and access ways shall be kept free of materials, supplies, and obstructions at all times.
2. Trash containers shall be located in all work areas. If a trash container is needed in your immediate work area, notify your Foreman.
3. Tools, material, extension cords, hoses, and/or debris shall be placed where they will not cause a hazard.
4. All rags shall be placed in proper rated containers and kept away from any possible fire hazard.
5. Spilled liquids can cause safety and health hazards and shall be cleaned up immediately. If you need assistance, notify your Foreman/supervisor or the Safety Department to facilitate the cleanup.
6. Keep change areas clean. Do not let soiled clothes, food scraps, and soft drink containers accumulate. Drinking cups, sandwich wrappers, paper bags, plastic water bottles and other trash shall be placed in the containers provided.
7. Toilets, wash-up facilities, drinking fountains, and water cans are provided for your convenience and comfort. All employees are expected to keep them clean and sanitary. Report any problems to your Foreman/supervisor.
8. Remove all protruding nails, staples, screws, or other objects that may present a hazard to personnel and/or equipment.
9. Alert other employees and the Foreman/supervisor of unusual circumstances within your work environment.

Ergonomics Program

The following mechanics can eliminate strains while performing routine tasks.

1. Use mechanical lifting devices when lifting heavy or bulky loads when practical.
2. When manually lifting, observe the following:
 - Assess the load.
 - Stand close to the object.
 - Place feet a comfortable distance apart and staggered.
 - Secure good footing.
 - Bend knees.
 - Take a firm grip on the object.
 - Test weight of load
 - Lift by straightening the legs, keeping the back straight.
 - When manually lowering the load, use reverse order.
3. Team lifting requires coordinating the efforts and using the same lifting techniques as above. When two or more employees are lifting or pulling together, one shall indicate when the lift is to begin.
4. When changing direction, change foot position rather than twisting at the waist.
5. Request help when attempting to manually lift or move objects that are too heavy or bulky to safely accomplish alone.
6. Do not carry loads in such a way as to obstruct view ahead.
7. Three points of contact shall be used when climbing onto, into or out of trucks, equipment, ladders, buckets, etc.
8. Whenever possible, avoid over-reaching.

Ladders, Elevated Work Places and Floor Openings

The purpose of this section is to prevent accidents and injuries from falls and to provide employees with the information for the safe use of fall protection and ladders in elevated work environments.

Definitions

Aerial Lift: a generic term for elevated work platforms which include certain designs such as a bucket truck, scissors lift, Genie lift, JLG's, etc.

Competent Person: one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, dangerous to employees, and who has authority to take prompt action to correct them.

Connectors: a device to couple or connect components of a personal fall arrest system or positioning device; only double locking snap hook connectors with 5,000 lbs. of tensile strength will be used; D-ring connectors shall also meet the 5,000 lb. tensile strength criteria.

Construction: work for construction, alteration, and/or repair, including painting and decorating

Fall Restraint System: a system consisting of full body harness, lanyard and connectors designed to limit the employee falling distance. Body belts cannot be used as part of Personal Fall Arrest System.

Full Body Harness: a system of straps, secured about the employee in a manner to distribute the fall arrest forces over at least the thighs, pelvis, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

Guardrails: railings installed along elevated work surfaces in compliance with applicable building codes used to prevent fall accidents.

Ladder: an appliance usually consisting of two side rails joined at regular intervals by cross pieces called steps, rungs or cleats on which a person may step in ascending or descending order. Ladders may be fixed or portable, free standing or non-self-supporting in design.

Lanyard: a flexible line or strap, suitable for supporting one person. One end is fastened to a harness and the other end is secured to a deceleration device, lifeline or anchorage. The lanyard shall have a maximum length at a level to provide for a fall of no greater than 6 feet.

Personal Fall Arrest System (PFAS): a system consisting of full body harness, impact absorbing lanyard, anchor and connectors designed to arrest an employee's fall; system shall be set up so that an employee can neither free fall more than 6 feet, nor contact any lower surface.

Safety net: nets provided for work in places more than 25 feet above the ground, water or other surfaces where the use of ladders, scaffolds, platforms, or body harnesses and lifelines are impractical. Maximum size of each safety net mesh opening shall not exceed 6 inches x 6 inches. The safety net shall be installed as close as possible below the work surface.

Standard guardrail system: guardrail system consisting of a top rail (42 inches plus or minus 3 inches), a mid-rail and a toe board. The guardrail shall be able to withstand 200 pounds of applied force.

Toe boards: a horizontal barrier at floor level erected along exposed edges of a floor opening, wall opening, platform, runway or ramp to prevent falls of materials.

Warning line systems: ropes, wires, or chains and supporting stanchions that form a barrier to warn of an unprotected edge.

Procedures

Ladder Safety

- Only portable fiberglass ladders meeting ANSI required Class 1A or greater (300 pound rating) are acceptable for use by J. F. Electric, Inc. personnel.
- Only ladders rated for load and type of use (as indicated on the manufacturer's label) shall be used in accordance with work performed.
- Ladders shall be inspected before each use.
- Ladders found to be damaged or in need of repair shall be immediately taken out of use and marked "Dangerous-Do Not Use". This label shall remain on the ladder until it can be repaired or replaced.
- Ladders shall be equipped with proper feet.
- Never stand on the top two rungs of a ladder.
- When using a straight or extension ladder, the 1:4 ratio for distance from the support is used. (Ex. If the distance from the ground to your work level is 20 feet, the ladder should be 5 feet away from the base of the structure.)
- Ladders shall extend 3 feet above the landing. When possible, block them at the base and secure them at the top.
- Workers shall always face the ladder when ascending and/or descending and shall not carry loads by hand.
- Never overreach or use ladders to support airlines, welding leads and hose.
- Ensure that both hands are free to grasp the ladder when ascending and/or descending, maintaining constant three (3) points of contact with ladder.

- Use barricades or other appropriate means to prevent collisions with ladder being used in doorways and/or high traffic areas.
- Never stand on the top two rungs of a stepladder or use it folded as a straight ladder.
- Annual ladder safety training is provided through the Safety Department. To request the training, contact your local Safety Representative.

Scaffolding and Elevated Working Platform Safety

- Scaffold work levels above 4 feet shall be equipped with standard guardrail systems, or individuals shall utilize a Personal Fall Arrest System.
- JLGs shall be equipped with a basket or with a surrounding guardrail system and closing gate or latch chain.
- When operating a boom lift employees shall be tied off inside the basket with a lanyard and harness (fall restraint system) in addition to surrounding standard guardrail system.

Floor Openings

- Hole covers shall be secured in place so as not to be dislodged.
- Covers shall be labeled with high visible wording such as "cover" or "hole".
- Covers shall be able to withstand 2 times the intended weight of traffic or load. This includes equipment traffic.
- A standard guardrail system may also be used as protection for floor openings.
- All floor and wall openings, open-sided floors, platforms, and runways 4 feet or more above the ground shall be guarded with standard railings and toe boards on all exposed sides.

Personal Fall Arrest Systems

Personal Fall Arrest Systems (PFAS) shall be used under the following conditions:

1. When working/walking on an elevated surface with an unprotected side or edge which is 4 feet or more above a lower level;
2. When building a scaffold that is 4 feet or more above a lower level.
3. When working on roofs with unprotected edges 4 feet or more above lower levels; or
4. When determined necessary by the supervisor or Foreman.
 - Personal Fall Arrest Systems shall be inspected for wear, damage or deterioration prior to each use.
 - Damaged harnesses, lanyards, lifelines or anchor points shall be immediately removed from service, labeled "Dangerous-Do Not Use". Equipment which cannot be repaired shall be destroyed.
 - Personal Fall Arrest Systems shall limit a worker's free-fall distance to six (6) feet without contacting a lower level.
 - Any PFAS or component subjected to a fall shall be immediately removed from service.
 - Lanyards cannot be clipped or tied back to itself unless they are designed to do so.

*Note: More stringent owner specific scaffold and elevated work platform rules may supersede J.F. Electric, Inc. rules.

Personal Protective Equipment

Head and Eye Protection

Hard hats and safety glasses with side shields shall be worn on all job sites. The exceptions to this rule is: when inside an enclosed vehicle and with Warehouse and Garage personnel as noted below.

- Warehouse and Garage personnel shall wear safety glasses when work is being performed.
- Warehouse personnel shall wear hard hats when operating a forklift and when pulling materials off a shelf.
- Warehouse personnel shall wear hard hats and safety glasses when on construction sites.

Only approved company-issued hard hats designed for electrical work that meet the requirements of ANSI Z89.2, Class E shall be worn. Hard hats shall not be defaced. Only work related, dielectrically tested stickers shall be applied to hard hats.

Only eye protection with side shields meeting ANSI Z87.1 shall be worn.

Eye and Face Protection

Special or high eye injury potential work processes require the use of additional eye/face protection. Examples include but are not limited to: welding, chipping and grinding. Appropriate eye and face protection shall be used. The most common example of increased eye protection is the use of goggles, safety glasses worn with a full-face shield and safety glasses worn with a welding helmet.

Hearing Protection

- Approved hearing protection shall be worn when employees are working in an area or with equipment that is designated as requiring protection.
 - Hearing protection shall be worn while operating certain equipment and as directed by supervision. Examples include, but are not limited to: jackhammers, chainsaws, compactors and air chisels.
 - An effective Hearing Conservation Program shall be provided whenever employee noise exposures equal or exceed OSHA's recommended time-weighted average.
 - Approved hearing protection shall be made available as required.
 - Employees required to wear hearing protection shall comply with the proper use, limitations and care of the protectors worn.
- Sound level assessments conducted by the Safety Department, shall be performed as hazard assessments require, and results shall be posted for employee review.

Permissible Noise Exposure

Duration (Hours)	Sound Level (dBA)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

*See Hearing Conservation Program in the Safety Procedures for additional information.

Footwear Protection

- Each employee shall wear shoes or footwear suitable for the work being performed. One example of approved foot protection is shoes with hard soles and leather type uppers.
- Boots designed for specific purposes (snow, chemical, etc.) shall be used as needed or required.
- Safety toe shoes and/or metatarsal guards shall be worn when required by the facility owner.
- Opened toed shoes shall not be worn except in office type jobs or when specifically prescribed by a physician

Cleaning and Maintenance

It is important that all PPE be kept sanitary and in a reliable condition by the employee to whom it is assigned. PPE is to be inspected, cleaned, and maintained by employees at regular intervals as part of their normal job duties so that the PPE provides adequate protection.

If a piece of PPE is in need of repair or replacement, it is the responsibility of the employee to bring it to the immediate attention of their supervisor or the Safety Department.

Defective or damaged personal protective equipment shall not be used.

PPE Training

Annual training on the proper use of personal protective equipment is provided through the Safety Department. To request the training, contact your local Safety Representative.

PPE Assessment Matrix

		Line	Inside	Warehouse	Mechanics
	Head	1	1	3 & 4	
	Eye	1	1	2 & 4	2
	Face & Eye	5	5	5	5
Hand	Work	2	2	2	5
	Rubber	7	7		
	Specialty		9		9
Foot	Work	1	1	2	2
	Safety Toe	6	6	2	2
	Metatarsal		6		
	Clothing	11 & 12	7 & 11	11	11
	Hearing	8	8	8	8
	Respiratory	10	10		10

- 1 On all job sites
- 2 When work is being performed
- 3 When operating a forklift and pulling materials off a shelf
- 4 When on construction sites
- 5 When exposed to welding, chipping, grinding, electrical arcs, etc.
- 6 When required by the owner
- 7 FR / AR clothing when exposed to electric arc / flash hazards
- 8 When exposure to noise exceeds 85dB in an 8 hour time-weighted average
- 9 When handling chemicals, sharp objects, etc.
- 10 When exposed to excessive dust, fumes, vapors, etc.
- 11 Reflective/Fluorescent vests/outerwear traffic vest when working within 15 feet of the roadway and heavy equipment operations.
- 12 FR/AR clothing gate to gate

Lockout/Tagout Program

Lockout/Tagout is the preferred method used to ensure that the machines and/or equipment are isolated from all potentially hazardous energy and locked out or tagged out before employees perform any servicing and/or maintenance activities where unexpected energy, startup or release of stored energy may cause injury or damage.

The Project/Operations Manager, General Foreman and/or Foreman working on a piece of equipment or system shall determine if the work to be performed requires that the equipment or system be locked out.

Once it is determined that a lockout is needed, identify all isolating devices to be certain which switches, valves or other energy isolating devices apply to the equipment or system to be locked and/or tagged out. This may include more than one energy source, as well as sources of stored energy.

All affected employees shall be notified that a lockout/tagout system is going to be utilized and the reasons therefore.

The Foreman is responsible to ensure equipment is shut down and is in a "zero energy" condition. It shall be determined that all power to the equipment or system is positively turned off and that all stored energy, such as springs, elevated machine members, capacitors, hydraulic systems, and air, gas, steam or water pressure, are dissipated or restrained, by methods such as repositioning, blocking, bleeding down, or other movement prevention devices which may be required, are in place.

When a "zero energy" condition has been established, a lock and/or tag shall be installed at all points where the equipment or system may be energized. The Foreman shall keep a record of all lockouts. If multiple trades/workgroups are to work on the equipment or system, gang locks shall be used and each trade/workgroup shall lock and tag the equipment or system while their work is in progress. Any individual who is required to work on a piece of power equipment or system shall be required to place their own lock and tag on the energy source for the equipment or system.

After the Lockout/Tagout has been installed, but before work begins, the system shall be tested and grounded or, after ensuring that no personnel are exposed, and as a check on having disconnected all energy sources, shall engage the normal operating controls to ensure that the equipment and/or system will not operate. The controls shall then be returned to the off or neutral position and work can start.

When work on a piece of equipment or system is completed, and the equipment or system is ready for normal operation, the Foreman shall check the area to ensure that no employees are

exposed. After all tools and grounds have been removed, and employees are in the clear, all lockout/tagout services may be removed.

The equipment or system is now ready to be re-energized.

*See Lockout/Tagout Procedure in the Safety Procedures for additional information.

Warehouse / Yard Personnel

Warehouse and yard employees work with a large inventory of tools, equipment and materials. While they are not actually working with the tools in a productive sense, they may be exposed to many of the same hazards. Additionally, warehouse and yard personnel may work with storage, loading and unloading exposures. Because the hazards to which they are exposed are numerous and sometimes unique, specific training shall be provided in the following areas

1. Safe driving practices
2. Proper lifting and back care
3. The use of personal protective equipment
4. Protection for fingers, hands and feet
5. Proper rigging methods
6. Forklift operations and safety
7. Proper loading and unloading techniques
8. Any other subjects which the Warehouse Manager deems necessary.

Personal Protective Equipment

Certain tasks performed by Warehouse personnel shall require the use of PPE. Personal protective equipment shall be available from the Warehouse Manager or Safety Department. Hard hats, safety glasses with side shields, goggles, face shields, earplugs, welding helmets, and/or gloves shall be issued and worn as determined by the Warehouse Manager.

Tools and Equipment

Sent to job sites

- All tools and equipment shall be inspected before being sent to a job site.
- Power tools shall comply with the manufacturers' recommendations for safe operation.
- Electrical equipment shall comply with the J. F. Electric Tools and Equipment Policy.
- Hand tools, ropers, rigging, harnesses, and other such items shall be checked for defects, damage or deterioration.
- All equipment and tools shall be loaded and shipped in such a way as to prevent damage during transit.

Returned from job sites

- Tools and equipment being returned to the warehouse shall be visually inspected for defects. They shall be tagged showing the nature of the damage or defect.
- Tools and equipment being returned to the warehouse shall be loaded or packed in such a way as to prevent damage.

Material Handling and Storage

Stored material and equipment shall not create a hazard. Storage areas shall be kept free of accumulated materials that may cause tripping, fire or explosion hazards, or create an unsanitary condition conducive for rodents and pests.

Stored material shall be kept in bins, stacked or placed on racks. Materials shall be blocked, or otherwise secured to prevent sliding, falling or collapsing. There shall be sufficient clearance around stored material for easy accessibility in moving or handling. All aisles and passageways around stored material shall be kept clear for emergency vehicle access in case of fire.

When loading, unloading or carrying extended lengths of material (conduit, ground rods, etc.), employees shall hold the front end high enough to prevent striking another employee (note MAD when applicable).

Employees should allow a working space of approximately 18 inches between the edge of the loading dock and material placed on the dock.

When loading or unloading from a dock, trucks shall be backed flush against the dock with the brakes set and wheels chocked.

Materials or equipment shall not be thrown from the truck to the dock or from the dock to the truck.

Material and equipment shall be loaded and stored on a truck in such a manner as to prevent falling, shifting or protruding.

Employees shall use steps, stairs or ladders to descend from elevations and shall not jump from platforms, docks or trucks.

Materials shall not be stored closer than 36 inches from overhead or wall mounted appliances such as: lights, heaters, fire protection equipment, electric panels and other similar devices.

Garage/Shop Personnel

General Safety

- Personnel shall not wear loose clothing, loose sleeves or gloves which can become entangled when working on or around shop equipment or vehicles.
- Safety toed shoes shall be worn when work is being performed.
- Long hair (including facial hair) or pony tails shall be secured to prevent becoming tangled when working around shop equipment or vehicles.
- Compressed air shall not be used to clean dirt and dust from clothing or the body.
- Compressed air shall be regulated to less than 30 psi when used for cleaning and only when effective chip guarding is used. Appropriate eye protection shall be worn at all times while using compressed air.

- Mechanics shall not place any part of their body directly under the wheels or tires of a vehicle on jacks without jack stands being in place

Maintenance Operations

Hand protection shall be worn when handling objects with sharp or jagged edges.

Environmental

- Where snow and ice conditions are present, personnel shall keep walkways, emergency exits and personnel and vehicle door openings free of snow and ice.
- Snow removal equipment and other vehicles with large amounts of snow and ice accumulation on the vehicle shall be brought into the garage and snow or ice allowed to melt before repairs are started. If this is not practical, the vehicles shall be washed with water to remove snow and ice. Melted snow and ice deposits from each vehicle shall be washed down the floor drains before work is started or another vehicle is moved into the area.

Vehicle Operation

- Vehicle operators and mechanics shall sound vehicle horns before backing and intermittently during the entire backing operation unless vehicles are equipped with backup alarms. Vehicle operators shall stop and sound horn prior to entering and leaving the garage.
- A spotter shall be posted when moving large equipment and vehicles backwards or in close quarters. The spotter shall be visible to the operator and shall not stand directly behind the vehicle.

Machine Guarding

- Machinery and shop equipment shall be maintained and operated by qualified personnel.
- All machinery guard and danger zones shall be conspicuously identified.
- No attempt shall be made to clean any part of a machine until all moving parts have come to a complete stop. Chips or other particles shall be removed by brushes or compressed air. If compressed air is used, the pressure at the discharge end of the air nozzle shall be less than 30 psi and effective chip guarding shall be used. Eye and/or face protection shall be worn while using compressed air to clean machines.
- Compressed air shall not be used to blow debris from a worker's body or clothing
- Compressed air shall not be used to blow dusts containing lead, beryllium, or cadmium.

Lifting Devices

- Periodic inspections shall be performed on lifting devices by qualified inspection or maintenance personnel.
- Test and certifications of cranes and hoists shall be performed by experienced, qualified inspectors.

- Certification, inspection and test reports shall be available on the premises where the crane or hoist is located.

Jacks

- Vehicle maintenance personnel shall not use hydraulic floor jacks, post jacks or mechanical jacks to support vehicles while repair is accomplished. The vehicle shall be blocked and placed on approved axle or frame stands before a repair operation is started.
- The rated load of the jack shall be legibly and permanently marked in a prominent location on the jack.
- Garage personnel shall not use a leaking or faulty jack. Defective jacks shall be taken out of service immediately, tagged and not used until repaired.
- Garage personnel shall exercise care in positioning jacks under vehicles, making sure the cap is properly located to preclude the jack slipping after the load is applied.
- All jacks shall be properly lubricated at regular intervals and only lubricants recommended by the manufacture shall be used.

Improper jacking can cause serious injury or property damage. The following jacking procedures shall be used:

- Jack stands shall be used any time equipment is jacked for maintenance.
- Equipment shall be removed from Jacks as soon as possible.
- Equipment shall be jacked to the minimum height required for the particular task.
- Workers shall only remain under a jacked unit for the time required to place axle or frame strands for support.
- Workers shall not position any portion of themselves under the tire or wheel of jacked equipment.
- Workers shall ensure placement of jack does not cause damage to the equipment.
- Jacks and jack stands shall be inspected and maintained to manufacturer's instruction.
- Defective jack stands shall be taken out of service immediately and discarded or tagged to no use until repaired.

Wheel and Tire Maintenance

Safe Operating Procedures – Multi-piece Rim Wheels. At a minimum, the following procedures shall be used:

- Tires shall be completely deflated by removing the valve core before a rim wheel is removed from the axle. If the axle and rim are secured by wedges and lug nuts, loosen the lug nuts out of the end of the stud, but DO NOT REMOVE. Lightly tap on wedges to break them free. When all wedges are broken free, lug nuts can be removed. Wedges can become dangerous projectiles if these procedures are not followed. Workers shall use mechanical devices, such as dollies, to help them remove or mount large, heavy tires.

- A nonflammable rubber lubricant shall be applied to bead and rim mating surfaces during assembly of the rim wheel and inflation of the tire, unless the wheel or tire manufacturer advises against its use. The rubber lubricants used shall not be flammable.

Safe Operating Procedures – Single-piece Rim Wheels. At a minimum, the following procedures shall be used:

- Tires shall be completely deflated by removing the valve core before demounting. Mechanical devices, such as dollies, shall be used to mount or remove large, heavy tires.
- Mounting and demounting of tire shall be performed only from the narrow ledge side of wheel. Care shall be taken to avoid damage to tire beads while mounting tires on wheels. Tires shall be mounted only on compatible wheels or matching bead diameter.
- A nonflammable rubber lubricant shall be applied to bead and wheel mating surfaces before assembly of the rim wheel and inflation of tire.
- If a bead expander is used to seat the beads, it shall be removed before the valve core is installed and before the tire is inflated to more than 10 psi.
- Tires may be inflated above 10 psi only when contained within a restraining device, positioned behind a barrier or bolted on the vehicle with lug nuts fully tightened.
- When inflating a tire, workers shall not place a rim wheel where it will rest against or within one foot of any flat solid surface, as measured from the sidewall. Exception: Hold-down components of a restraining device may be placed within one foot of the sidewall.
- Tires shall not be inflated to more than their recommended operating pressure. The proper tire inflation pressure, tire size and load range can be found on the vehicle information/data plates or stenciled on the door jamb/glove box or as specified in the owner's manual.
- Workers shall stay out of the trajectory when inflating a tire. If the tire beads are not fully seated by the time the tire is inflated to its recommended pressure, the tire shall be deflated and rim wheel disassembled. The wheel and tire shall be rechecked for compatibility, re-lubricated, repositioned and then re-inflated.
- No heat shall be applied to a single piece wheel when a tire is mounted on it. Exception: After the tire is completely deflated, the lug nuts may be briefly heated to facilitate their removal.
- Cracked, broken, bent or otherwise damaged wheels shall not be reworked, welded, brazed or otherwise heated.
- Rims shall be inspected and maintained to the equipment manufacturer's rim manuals.

Demounting, Mounting and Inflating (All Types of tires).

Garage Personnel shall:

- Respect the potential power and explosive force of air under pressure. Serious mishaps have resulted from lack of awareness of the explosive potential of compressed air.
- Make sure all tools are in good condition – not damaged, dented or deformed.
- Remove valve core and exhaust all air from the tire (or tires, in the case of a dual assembly), before demounting.

- Block vehicle so it cannot roll forward or backward after it is lifted.
- Place large blocks under the jack, regardless of how hard or firm the ground appears.
- Place safety jack stands – or crib up with blocks – at an appropriate spot under the vehicle, in case the jack slips.
- Check rim diameter to ensure it exactly matches rim diameter molded on tire.
- Clean and inspect used rim parts thoroughly.
- Inspect inside of tire for loose cords, cuts, penetrating objects or other carcass damage. Tires that are damaged beyond simple repair shall be removed from service. Remove dirt, debris, and liquids from inside of tire before the tube is installed.
- Lubricate with approved rubber lubricant, such as a soap solution.
- Use a clip-on chuck and extension hose with remote control valve and pressure gauge, long enough to allow you to stand to one side – not in front of the assembly – during inflation.
- Center tire properly on rim before inflating.
- Securely lock wheel down or place assembly in safety cage or portable safety device before attempting to inflate tire to seat beads.
- Position the vehicle crane boom in the center of the hub prior to inflation of off-the-road tires in field service work.
- Check for proper flange and lock ring seating.
- Adjust air pressure to manufacturer's recommended cold operating pressure after beads have been seated...

Garage Personnel shall NOT:

- Work on tire and rim assemblies until they review applicable safety practices and procedures.
- Loosen lug nuts on dual equipment with split or multi-piece rims until all air is exhausted from both tires. A broken or cracked rim part under pressure may blow apart and seriously injure or kill if lugs are removed before air is exhausted.
- Re-inflate a tire that has been run flat or seriously under-inflated without demounting that tire and check tire and tube for damage.
- Mix rim parts of different manufacturers unless approved by those manufacturers.
- Rework, weld, heat or braze rim parts. Always replace damaged parts with same size, type, and make.
- Inflate beyond recommended bead seating pressure.
- Stand over tire when inflating.

Welding in Garage – General Precautions

- Inspect all welding equipment regularly. Welding equipment with worn, leaky, or burned hoses or damaged cables and connections shall not be used.
- Never weld or cut gas tanks, oil barrels or drums.
- Weld behind flame resistant screens or in booths to protect other workers from flying sparks and flash burns.

- Always provide adequate ventilation. Arrange work so air movement pulls fumes away from the breathing zone.
- Wear clean, oil free, flame resistant clothing while welding. Wear protective gloves and apron (hearing protection may be required for some welding operations).
- Wear welder's welding helmet/face shield as required.
- Provide a suitable fire extinguisher in the vicinity of the welding area.
- Always mark hot work either with a sign or with chalk on the work itself.
- Store welding equipment securely when not in use.

Radiator Maintenance

- Never open a pressurized radiator while the engine is hot.
- Wear hand protection when handling jagged metal edges.

Fuel Tank Repairs

- Vehicles with leaking fuel tanks shall be removed from the garage immediately. Ground the siphon tank and pump out remaining fuel into metal safety can.

PPE Requirements for Frequently Performed Vehicle Maintenance Tasks	
Operation	PPE Type
Battery Handling	Eye Protection
	Gloves
Body Repairs	Gloves
	Eye Protection (*Note 2)
	Respiratory Protection (May be required for Sanding Operations)
Compressed Air Cleaning	Eye Protection (*Note 2)
Machinery and Grinders	Eye Protection (*Note 2)
Paint Operations	Protective Clothing
	Eye Protection
	Rubber Gloves
Radiator Maintenance	Eye Protection
	Gloves
Soldering	Vented Goggles
	Face Shield
	Gloves
Tire Repair	Gloves
	Eye Protection
	Foot Protection
	Hearing Protection
Welding	Welder's goggles/helmet
	Foot Protection
	Flame Resistant Clothing
	Glove
	Apron

Note 1: PPE listed above are the minimum requirements.

Note 2: Safety goggles, face shield, safety glasses (glasses with shatterproof lens and side shields) or a combination thereof, shall be worn during operations requirement use of power and/or hand tools where airborne fragments of the tool and/or work material may contact the

eyes, face or neck. These operations include, but are not limited to, drilling, grinding, chipping, cutting (with chisel), sandblasting and scaling metals. Approved eye protection is mandatory while using stone or wire wheel grinders regardless of whether or not eye shields are installed on the grinders. Face shields shall be worn in conjunction with approved eye protection, i.e., safety glasses.

Drug and Alcohol Free Workplace Policy

Out of concern for the health and safety of its workforce, general public, and to ensure compliance with federal requirements, J. F. Electric, Inc. has adopted a Drug and Alcohol Free Workplace Policy.

The first section of this policy prohibits the manufacture, distribution, sale, possession and/or use of controlled substance and/or alcohol in the workplace. The second section creates a Drug and Alcohol Awareness Program that assists in educating employees regarding the dangers of drug and alcohol use, and about the availability of private and community treatment facilities. The final section lists the disciplinary consequences for violations of the Drug and Alcohol Free Workplace Policy.

JF Electric, Inc. shall notify each employee that, as a condition of employment, each employee shall:

- Sign and date a form stipulating that they are aware of this policy;
- Comply with the company's Drug and Alcohol Free Workplace Policy; and
- Notify J. F. Electric, Inc. of any charge and/or conviction of a drug or alcohol related offense committed outside the workplace within five (5) days of the conviction.

Employees: All DOT and PHMSA regulated employees of J. F. Electric, Inc. are defined as employees under the federal requirements, regardless of the contractual relationship which may be alleged to exist between management, labor, and all contractors and subcontractors. All other employees of J. F. Electric, Inc. are subject to this policy at the owner's request.

This policy shall be fully complied with by all subcontractors, and their employees, without exceptions.

Prohibitions

J. F. Electric's, Inc. Drug and Alcohol Free Workplace Policy prohibits employees from engaging in any of the following activities:

1. Use, possession, manufacture, distribution, or sale of illegal drugs and/or alcohol on company premises or while conducting company business, in company supplied vehicles, during working hours, or on a job site;
2. Unauthorized use or possession, or any manufacture, distribution, or sale of controlled substance and/or alcohol on company premises or while on company business, while in company supplied vehicles, or on a job site;
3. Storing in a locker, desk, automobile or other repository on company premises or job site any controlled substances and/or alcohol whose use is unauthorized;

4. Being under the influence of a controlled substance and/or alcohol on company premises or while on company business, or while in company supplied vehicles, or job site;
5. Any possession, use, manufacture, distribution, or sale of illegal drugs and/or alcohol off company premises that adversely affects the individual's work performance, his own or other's safety at work, or the company's regard or reputation in the community;
6. Failure to adhere to the requirements of any drug or alcohol treatment or counseling program in which the employee is enrolled; and
7. Failure to notify the company of any arrest and/or conviction under criminal drug and/or alcohol statutes for a non-workplace offense within five (5) days of the conviction.

For the purpose of this policy, being under the influence of a controlled substance is the presence of any controlled substance or illegal drug in the employee's body system. Being under the influence of alcohol or alcohol abuse shall be measured at .02% EBT content or higher being positive.

Authorized Use Of Prescribed Medicine

An employee undergoing prescribed medical treatment with any drug which may alter his or her physical or mental ability shall report this treatment to the company's Safety Department within the first available date of initiating this treatment. The Safety Department shall determine whether a temporary change in the employee's job assignment during the period of treatment is warranted, and may require the treating physician to identify the changes and coordinate any restrictions.

Test results above the cutoff levels for the recreational use of marijuana or a prescription for medical marijuana shall both be considered positive tests.

Drug and Alcohol Awareness Program

To assist employees in understanding and avoiding the perils of drug and/or alcohol abuse, J. F. Electric, Inc. has developed a comprehensive Drug and Alcohol Awareness Program. The company shall use this program in an effort to prevent and eliminate drug and alcohol abuse. The Drug and Alcohol Awareness Program shall inform employees about:

1. Dangers of drug and alcohol abuse in the workplace;
2. Our company's Drug and Alcohol Free Workplace Policy;
3. Availability of referral for treatment and counseling for employees who voluntarily seek such assistance; and
4. Sanctions for violations of this policy.

The employees of J. F. Electric, Inc. are our most valuable asset and, for that reason, their health and safety is our number one concern. Therefore, *J. F. Electric, Inc. has a zero tolerance program*. J. F. Electric, Inc. is committed to maintaining a safe workplace, free from the influence of drugs and alcohol. All employees and subcontractors are hereby notified that J. F. Electric, Inc. shall comply with the requirements of the Drug-Free

Workplace Act of 1988, and all applicable regulations issued there under, as well as any more stringent rules promulgated by other federal and state agencies or owner requirements, when applicable.

Early recognition and treatment of drug and/or alcohol abuse is important for successful rehabilitation. Whenever feasible, J. F. Electric, Inc. shall assist employees in overcoming drug and/or alcohol abuse by providing information on treatment opportunities and programs. However, the decision to seek diagnosis and accept treatment for drug and/or alcohol abuse is primarily the individual's responsibility. Employees seeking such diagnosis and treatment should request assistance from the Designated Employee Representative. The company shall treat such requests as confidential and shall refer the employee to the appropriate treatment and counseling services. Treatment shall be at the employee's expense.

Employees, who voluntarily request the company's assistance in dealing with a drug and/or alcohol abuse problem may do so without jeopardizing their continued employment, provided they strictly adhere to the terms of their treatment and counseling program. At a minimum, these terms include a fit for duty release from an attending physician, the immediate cessation of any use of drugs and/or alcohol, and participation in periodic, unannounced testing for a twenty-four (24) month period following enrollment in the program.

Voluntary requests for assistance from employees shall not, however, prevent disciplinary action for violation of J. F. Electric's Drug and Alcohol Free Workplace Policy.

Disciplinary Actions

1. Any violation of J. F. Electric's Drug and Alcohol Free Workplace Policy shall result in disciplinary action, including dismissal, at the company's sole discretion.
 2. In addition to any disciplinary action, the company may refer the employee, at the employee's expense, to a treatment and counseling program for drug and/or alcohol abuse. Employees referred to such a program by the company shall immediately cease any drug and/or alcohol use, be subject to periodic unannounced testing for a period of twenty-four (24) months, and must comply with all other conditions of the treatment and counseling program. Upon receiving a fit for duty release from an attending physician, the company shall determine the employee's position of employment status.
 3. J. F. Electric, Inc. shall promptly terminate any employee who tests positive for drugs and/or alcohol while undergoing treatment and counseling for drug and/or alcohol abuse.
 4. After an employee has had two (2) positive drug and/or alcohol tests, they can NOT be rehired for at least one (1) year.
 5. J. F. Electric, Inc. shall evaluate each instance an employee fails or refuses testing. The severity of discipline shall be determined on a case-by-case basis. However, refusal of testing in light of probable cause behavior shall result in immediate removal from assignment and management review of the employee's employment status.
-

Testing

Types of Testing

J. F. Electric employees are subject to required drug and/or alcohol testing:

1. Pre-employment (Per DOT or owner specifications)
2. Reasonable Suspicion - the following are the most commonly observed signs considered for "reasonable suspicion" testing:
 - a) Accident or near-miss
 - b) Erratic behavior
 - c) Sudden mood swings
 - d) Excessive risk taking
 - e) Lack of cooperation
 - f) Customer complaints
 - g) Tardiness
 - h) Excessive absences (Mon/Fri and paydays)
 - i) Frequent mistakes
 - j) Declining performance

These are specific actions that require "reasonable suspicion" testing:

- a) Dilated or constricted pupils
- b) Glassy or reddened eyes
- c) Flushed face
- d) Slurred speech
- e) Alcohol or marijuana odor on breath or clothing
- f) Staggering or unsteady gait
- g) Stumbling or falling

The Company reserves the right to require any employee to be evaluated at our designated medical facility, if there is reasonable suspicion based on deteriorating job performance. Reasonable suspicion shall mean behavior, which indicates an impaired physical condition endangering the safety of the employee, other employees, company or owner property or the public. Such reasonable suspicion shall be confirmed by no less than two levels of management, including the Foreman. The Company is neither diagnosing nor accusing the employee of being impaired but is acting on aberrant behavior. If there is a satisfactory explanation for the behavior, the supervisor shall make further assessments for the employee's fitness to work.

The supervisor shall document all actions thoroughly. These records along with all records of testing and any subsequent retesting and associated documents shall be retained by the Company for the entire employment period of an employee. These shall be maintained separate from the "Employment Records" by the Safety Department. (See Aberrant Behavior Checklist).

3. Post-Accident Testing
 - a) An accident is defined as an unexpected, unintentional, unplanned, and undesirable event that results in personal injury or property damage.
 - b) A near-miss accident is defined as an incident that has the potential of causing an injury, motor vehicle accident, property damage or environmental harm.
4. Post Rehabilitation - for twenty-four (24) months following completion in a drug and/or alcohol abuse program.
5. Random Testing - in addition to DOT and PHMSA mandated testing, J. F. Electric, Inc. also conducts random drug testing according to the owners specifications.

The type of tests to use for drug and alcohol screening shall be determined by the laboratory doing the testing, and the medical facility collecting the sample. Positive results shall be confirmed by the use of a second and different method of testing. At present, the initial drug test is done by the Enzyme Immunochemical Assay (EMIT) Method. A positive test is then confirmed by using Gas Chromatograph/Mass Spectrometry (GS/MS). Testing for alcohol abuse shall be at levels of .02% EBT or higher being positive. Alcohol screening shall be performed by a breath alcohol test. Current DOT/PHMSA testing parameters are for a five (5) panel (Schedule B) test only. J. F. Electric, Inc. will continue its original ten (10) panel (Schedule A) testing for all other owners.

Confidentiality

The results of any blood or urine analysis shall be kept confidential among the employee, the clinic, any outside laboratory used for the analysis and J. F. Electric, Inc. However, the company may use the results to decide upon action to be taken to the extent necessary to defend itself in any subsequent grievance procedure, arbitration, or legal action, including worker's compensation proceedings.

CDL drug/alcohol test results by law, may be shared with future employers.

Test Levels - Schedule A

The following initial cutoff levels shall be used, at the owner's request, when screening specimens to determine whether they are negative for the following:

Drugs to be Tested	EMIT	GC/MS
Amphetamines	300 ng/ml	300 ng/ml
Barbiturates	300 ng/ml	100 ng/ml
Cannabinoids	20 ng/ml	10 ng/ml
THC		
Marijuana		
Benzodiazepines	300 ng/ml	100 ng/ml
Benzoyllecgonine	300 ng/ml	150 ng/ml
Cocaine		
Opiates	300 ng/ml	150 ng/ml
Heroin		

Methadone	300 ng/ml	100 ng/ml
Phencyclidine – PCP	25 ng/ml	25 ng/ml
Propoxyphene	300 ng/ml	200 ng/ml
Methaqualone	300 ng/ml	200 ng/ml

Schedule B Testing

For DOT/ PHMSA owners, the following screening shall be followed:

	Confirmed	Confirmation Test
	Initial Level	Cut-Off Level
Drugs to be tested	(ng/ml)	(ng/ml)
Amphetamine	500	250
Cocaine	150	100
Opiates	2000	2000
Phencyclidine – PCP	25	25
Marijuana (Cannabinoid)	50	15
Alcohol	Screening	Confirmation
	0.02 – EBT	0.02 – EBT

Collections shall be performed by a third party administrator. Testing shall be performed at a Substance Abuse and Mental Health Services Administration (SAMSHA) certified laboratory. A Medical Review Officer (MRO) shall be available to ensure test validity and to counsel with employees on test results. Employee may, at employee’s expense, request that a sample be retained at a laboratory of his choice for a period of one year.

Emergency Call Outs

Due to the nature of the work we perform, there will be times when employees will be called into work during off duty or weekend hours. All sections of this policy are in full force during these emergency call outs. In regard to alcohol, employees must realize that it takes very little alcohol consumption to attain a level of .02% EBT.

Therefore:

1. Employees who have consumed one (1) drink within four (4) hours of the Emergency Call Out, MUST refuse the Emergency Call Out.
2. J. F. Electric, Inc. strongly recommends that employees who have consumed any alcoholic beverages refuse Emergency Call Outs.

Subcontractors

All subcontractors shall fully comply with this policy, without exception.

*See CDL Drivers Alcohol/Controlled Substance Policy and Procedure in the Safety Procedures for additional information.

Aberrant Behavior Checklist

Section 1

Employee Name: _____ Job Title: _____

Date of Observation: _____ Time: _____ AM/PM

Location: _____ Division/Work Unit: _____

Employee performing safety-sensitive duties: YES NO

Section 2 – Observations (Check ALL that apply)

BEHAVIOR

- Stumbling, unsteady gait
- Drowsy, sleepy, lethargic
- Agitated, anxious, restless
- Hostile, belligerent
- Irritable, moody
- Depressed, withdrawn
- Unresponsive, distracted
- Clumsy, uncoordinated
- Tremors, shakes
- Flu-like illness complaints
- Suspicious, paranoid
- Hyperactive, fidgety
- Frequent use of mints, mouthwash, breath sprays, eye drops
- Inappropriate, uninhibited behavior

APPEARANCE

- Flushed complexion
- Sweating
- Cold, clammy, sweats
- Bloodshot eyes
- Tearing, watery eyes
- Dilated (large) pupils
- Constricted (pinpoint) pupils
- Unfocused, blank stare
- Disheveled clothing
- Unkempt grooming

SPEECH

- Slurred, thick
- Incoherent
- Exaggerated enunciation
- Loud, boisterous
- Rapid, pressured
- Excessively talkative
- Nonsensical, silly
- Cursing
- Threatening speech
- Verbally abusive speech

BODY ODORS

- Alcohol
- Marijuana

OTHER

OBSERVATIONS: _____

Section 3 – The observations, as documented above, were made by the employee identified in Section 1

Supervisor Name (printed)

Signature

Date

Additional Witness: (optional)

Witness Name (printed)

Signature

Date

Section 4

Determination:

Reasonable Suspicion Alcohol Breath Test

No Test Conducted

Reasonable Suspicion Drug Urine Test

8 hours elapsed

No Test Required

No collection available

Employee Refused Test

Transported for medical care/evaluation

Other (explain)

Section 5

Employee transported to collection site by: _____

Time transported: _____ AM/PM Collection Site: _____

Supervisor Training/Education

Supervisors shall be trained on the physiological and psychological aspects of addiction. This would include how to detect and document early deteriorating job performance that may be related to alcohol and drug abuse.

They shall know the procedures to introduce and initiate drivers to the alcohol and controlled substance testing program.

The training shall include the physiological and psychological effects of drugs and alcohol on the human body-60 minutes of training on alcohol misuse and an additional 60 minutes of training on controlled substances.

In addition, they shall be trained on the policy issues of alcohol/drug testing. An overview of laboratory, quality assurance, quality controls and testing methodologies. Chain of Custody procedures, collection protocols and confidentiality. Medical Review Officer (MRO) and Substance Abuse Professional (SAP) responsibilities in reviewing and interpreting positive alcohol/drug test results.

Employee Safety Recommendation Program

All employees are strongly encouraged to participate in the Employee Safety Recommendation Program (ESRP). The ESRP allows employees to help identify potential hazards in the work place before they occur. Prevention is a key element in any effective safety program.

Additional Employee Safety Recommendation Forms (below) may be obtained from the Foreman or the Safety Department. They shall be filled out listing:

1. Project Name
2. Date
3. Location of Hazard
4. Description of Hazard
5. Suggestions to minimize or eliminate the hazard

All completed ESR forms should be promptly turned in to the Foreman for immediate review and appropriate corrective action. The corrective action taken shall be reported to the employee initiating the original report. All ESR forms shall be reviewed by the Project/Operations Manager, Department Manager, Vice President, Head of the Safety Department, and Safety Representative.

Employee participation is essential for this program to work and to assist in maintaining a safe working environment.

Employee Safety Recommendation Form

Date: _____

Project/Job Name: _____

Employee Name: _____ Foreman: _____

Description of Problem/Hazard:

Suggestions for Correction:

Disposition Comments and Corrective Action Taken:

Corrected by: _____ Date: _____

Foreman: _____ Date: _____

Subcontractor Safety Policy

Subcontractors shall initiate, maintain and supervise all safety precautions and programs in connection with their work. As a minimum, the subcontractor's rules and safety procedures shall be at least as stringent as those of J. F. Electric, Inc. and the owner.

Subcontractors:

1. Shall be in compliance with all OSHA, federal, state, and local safety regulations.
2. Shall be in compliance with the safety programs of J. F. Electric, Inc. and the owner.
3. Shall provide and enforce the use of appropriate personal protective equipment.
4. Promptly investigate any accident, injury, or damage to property and file reports with the General Foreman/Foreman, Project/Operations Manager, and J. F. Electric Safety Department within 24 hours.
5. Comply with all documentation requirements of the government, owner, insurance company, and J. F. Electric, Inc. Copies to be available for inspection by OSHA, the owner or J. F. Electric, Inc.
6. Shall maintain and use tools, equipment, and machinery in accordance to manufacturer recommendation, in safe condition, and within proper inspections.
7. Shall maintain good housekeeping and provide proper fire protection equipment.
8. Require employee participation in:
 - a. New employee orientation
 - b. Weekly safety meetings
 - c. Attendance by supervisory personnel at project meetings

Violations of this policy shall be documented by the J. F. Electric General Foreman/Foreman, Project/Operations Manager, or Safety Representative, with copies forwarded to the subcontractor's offices for follow-up.

Subcontractor Evaluation Criteria

Prior to engaging a subcontractor on a project, Project/Operations Managers are strongly recommended to ensure that the contractor has an effective safety program, is capable of conducting its operations in a safe manner and has appropriate insurance coverage. The following guidelines shall be followed in determining whether the subcontractor may be used on a J. F. Electric, Inc. project:

The subcontractor shall complete the header section on page 1 of the Subcontractor Prequalification Safety Evaluation Form including their North American Industry Classification System code (NAICS), and the completed form forwarded to the JF Electric Safety Department for review.

Safety Performance Data Responses

The numbers below directly correspond to the questions in the following Subcontractor Prequalification Safety Evaluation Form.

1. If yes, review safety performance history with previous J. F. Electric Project/Operations Manager.
2. For any EMR listed as greater than 1.0 the subcontractor has failed the evaluation. If all EMR's listed are 1.0 or below, continue with evaluation.
3. Record numbers from the three most recent OSHA 300 forms
4. Determine the subcontractor's citation history at: <http://www.osha.gov/>. Compare the published data to the subcontractor questionnaire. The subcontractor shall explain any discrepancies. Look for large number of serious and repeat violations. If they suggest a problem, request additional information.
5. If subcontractor answers "yes" to willful violations, request a detailed explanation.
6. For small subcontractors a "no" answer is not unexpected and may be acceptable with good EMR and OSHA numbers. At least a minimal program is expected depending on the complexity of the work
7. See 6.
8. It is expected that a subcontractor being hired to perform services on the project site should be the best prepared to address safety issues for their operations, especially when specialty work is being conducted or for work in which the subcontractor possesses superior knowledge of their operations. A "no" answer requires additional information

Note: For the above responses not meeting JF Electric, Inc. requirements, the Project/Operations Manager and Safety Department shall review and make a final determination.

Risk Management/Insurance Data

1. The inability to provide insurance coverage at or above \$1,000,000 requires referral to counsel.
2. Proof of Workers Compensation Insurance is required. Refer any questions to counsel.
3. Ability to provide Insurance Certificates naming J. F. Electric, Inc. as an additional insured is required. Refer any questions to counsel.

Subcontractor Prequalification Safety Evaluation Form

It is the policy of J.F. Electric, Inc. to provide a safe and healthful environment for all of its employees through the prevention of occupational injuries and illnesses. As such, J.F. Electric, Inc. considers safety a value and requests the following information from all subcontractors.

Company Name	
Company Address	
Submitted by	
Title	
Phone	
Fax	
Type of Services Performed	
NAICS Code	
No. of Employees in Company	
Date of Submittal	

Safety Performance Data

1. Has your company performed work as a subcontractor for J.F. Electric, Inc. previously?

Yes

No

If yes, explain the nature of the work, project location and project date, J.F. Electric Project/Operations Manager and telephone number.

Worker Compensation Experience Information

2. a.) List your Interstate Worker Compensation Experience Modification Rate (EMR) for the last three full years below:

Year	EMR	Carrier	Policy Number

b.) We require verification of your EMR. Please attach the endorsement page from your policy listing your EMR or have your insurance broker provide the information on their letterhead.

c.) If your EMR is 1.0 or exceed 1.0 for one or more years above, please explain:

<u>3. Workplace Injuries and Illnesses:</u>	Year	Year	Year
Provide the following information:			
A.Number of fatalities (attach description of event) (G)			
B.Number of cases that involved days away from work, or days restricted work activity, or both (H & I)			
C.Number of cases involving recordable cases without lost or restricted work days (J)			
D.Total Recordable Cases (G+H+I+J)			
E.Total Occupational Illnesses(1+2+3+4+5+6)			
F.Total hours worked			
G.OSHA Total Recordable Incident Rate*			
H.OSHA Lost Workday Case Incident Rate**			

*Incident Rate = (Total Cases x 200,000)/Total hours worked

**Lost Workday Case Incident Rate # = (Total Lost Workday Cases x 200,000)/Total hours worked.

4. Describe any workplace safety regulator agency (e.g. OSHA) citation and violation the Company has received in the past three years. Explain the nature of the citation, classification, and final penalty. Describe the resolution of any serious violations. Please feel free to attach separate statements where more space is required

Year: _____ Number of Citations: _____ Final Penalty Amount: _____

Citation Statement:

Year: _____ Number of Citations: _____ Final Penalty Amount: _____

Citation Statement:

Year: _____ Number of Citations: _____ Final Penalty Amount: _____

Citation Statement:

5. Has your company received any willful violations? Yes No

6. Does your company maintain a written Health and Safety program? Yes No
If yes include a copy of Table of Contents.

7. Please provide onsite safety officer name and telephone number:

Name: _____ Telephone: _____

Subcontractor will provide a project specific safety plan prior to start of work.

8. Subcontractor will provide a listing of all hazardous materials brought on site and used on projects and/or stored in our facilities for future use and list is maintained at all job sites. If an employee should find a hazardous material that is not on the list, it shall be reported immediately to the Foreman or Safety Department.

Subcontractors shall maintain a file on SDSs covering every substance on the list of hazardous materials. Furthermore, it is a condition of purchase that materials shipped to

the job site shall be accompanied by the appropriate SDS. SDSs shall be maintained at all job sites and be readily accessible to all employees.

Risk Management/ Insurance Data

1. Does your firm insurance coverage for commercial liability and automobile liability without limits of a least \$1,000,000? **YES** **NO**
(Note that certain J.F. Electric, Inc. client contracts require insurance in excess of the levels noted above. Inability to supply insurance at levels required by J.F. Electric, Inc. client contract could result in disqualification.)
2. Are you able to provide J.F. Electric, Inc. with insurance certificates naming J.F. Electric, Inc., and if requested, J.F. Electric’s client as an additional insured? **YES** **NO**
3. Please provide proof of current Worker’s Compensation and Employers Liability Insurance coverage (attach certificate)

VERIFICATION OF DATA

Please have an officer of the Company sign below certifying that the information provided in this document is current and correct.

Name: _____

Title: _____

Signature: _____

Date: _____

Misrepresentation of data requested is grounds for immediate termination of contracts and disqualification from future consideration.

J.F. Electric, Inc. Use Only	
Date Received: _____	Evaluated by: _____
Referrals only required as per Attachment 2	
Submitted to Safety Rep. for evaluation: Safety Rep: _____	
Pass / Fail (Circle One)	
Submitted to Counsel for evaluation: Counsel: _____	
Pass / Fail (Circle One)	
Final Evaluation Project/Operations Manager: _____	
Pass / Fail (Circle One)	
Signature: _____	Date: _____

Disciplinary Policy

In our endeavor to eliminate accidents and prevent injuries on our job sites, J. F. Electric, Inc. has instituted a disciplinary policy. It is the intent of this policy to assist in providing a safe and healthy work environment to protect the owners, employees, and general public on all job sites.

J. F. Electric, Inc. has identified the following infractions that require disciplinary action:

1. Violation of the safety manual and/or policies
2. Violation of generally accepted work practices
3. Violation of local, state, and/or federal law, including civil, criminal MSHA and OSHA statutes and regulations
4. Violation of applicable codes, including but not limited to the National Electrical Code and/or Fire Codes
5. Lack of commitment to the overall company safety goals and objectives

Minimum disciplinary action shall be handled in the following manner:

- First Violation-----Verbal Warning (documented)
- Second Violation-----Written Warning
- Third Violation-----Suspension
- Fourth Violation-----Up to and including dismissal

Disciplinary proceedings are instituted by J. F. Electric Supervisors, General Foremen/Foremen, Project/Operations Managers, Safety personnel, company officials or authorized representatives.

No policy can cover all instances or circumstances that may arise. Certain violations shall be deemed so serious as to require immediate disciplinary action, up to and including dismissal, and those policies that are written shall be identified with that warning. Nothing in this policy shall prohibit the owner and/or general contractor from enforcing their own standards and policies.

UTILITY LINE DEPARTMENT: Please see Disciplinary Policy in Utility Line Department Section.
INSIDE DEPARTMENT: Please see Disciplinary Policy in Inside Department Section.

Environmental Compliance Policy

Environmental compliance at J.F. Electric, Inc. is both a legal requirement and social responsibility. J.F. Electric, Inc. takes environmental compliance very seriously. Our goal each year is zero environmental issues.

Spill Prevention and Response

- Properly store all liquids: containers shall be properly labeled, secured at all times, stored safely away from storm drains and other sensitive areas, and regularly inspected for leaks.
- Secondary containment for 55 gallon and larger oil containers shall be provided.
- Properly maintain containers, equipment and vehicles to prevent leaks and spills.
- Know where to obtain spill kits easily when handling fluids.
- Immediately eliminate all sources of ignition, clean up spills from your containers, equipment and vehicles. Consult your Safety Representative for reporting requirements and clean up instructions for larger spills. The Safety Department shall contact local EPA for all necessary regulatory notifications.

Waste Management

- Properly contain, label, store and dispose of all debris from work sites, storage areas, parking areas, and other areas of operations. All items are to be removed and the area returned to its original condition before vacating the site.
- Contact your Safety Representative before removing any materials from owner's facilities that may contain contaminants such as PCBs, lead, asbestos, mercury and when requiring special handling/disposal.

Construction Activities

- Contact your Safety Representative before conducting boring operations under streams, and crossing streams, floodplains, wetlands and critical dunes. Permits are normally required, and shall be obtained per contract terms by J.F. Electric, Inc. or the owner.
- Take appropriate measures to control erosion and sediment from all areas disturbed during construction. Soil disturbances greater than one acre require storm water construction permits and pollution prevention plans before starting work.
- Restore/repair all erosion control devices and areas you disturb during your construction activities.

General

- Contact your Safety Representative before starting demolition/ renovation activities in areas that may contain asbestos, lead, and other contaminants. Most states require written notification prior to starting this type of work.
- Report all large bird interactions with the facility owner, following the owner's reporting procedures.

- Immediately notify your Safety Representative if an Environmental Regulatory Inspector arrives at your work site.

Spill Prevention and Response

- Do not leave drip pans, and open containers unattended. To prevent spills, keep containers sealed at all times.

Waste Management

- Do not litter or dispose of debris by open burning.
- Do not discard lighting fixtures in metal recycling bins without first ensuring the bulbs and small PCB capacitors have been removed and stored for recycling/disposal.

Construction Activities

- Do not allow sediment, drilling and hydro excavating fluids to runoff construction sites and enter storm drains, waterways and wetlands.
- Do not fill wetlands or inadvertently create wetlands with construction activities.
- Hydro excavating fluids shall be disposed of in an approved manner.

Training

- Environmental Compliance training shall be provided as required.

Hazard Communication/Globally Harmonized System

The Hazard Communication (HAZCOM)/Globally Harmonized System (GHS) Program has been developed with the intent that employees be informed about the hazardous substances which may be encountered at JF Electric, Inc. and the appropriate protective measures to be followed for safe handling of these substances. This HazCom/GHS Program conforms to the Federal OSHA HazCom/GHS Standard. For further information, refer to the JF Electric Hazard Communication/Globally Harmonized System Procedure. (Household chemicals, purchased in normal household quantities, are exempt from this program). The Head of the Safety Department shall be responsible for the HazCom/GHS Program.

Chemicals

Only solvents, adhesives or other chemicals that are approved shall be used in the workplace.

Responsibilities

It is the responsibility of each employee and all levels of supervision to be aware of the hazards related to the use of chemicals in the workplace and enforce the rules related to their use.

Each job site shall maintain a file of safety data sheets (SDS) for each chemical at the workplace.

Understanding Safety Data Sheets










There are typically sixteen (16) sections on a SDS. Each section contains pertinent information that should be read and understood before starting to work with hazardous material. Each section shall be in the following order:

1. Identification
2. Hazard(s) identification
3. Composition/ingredients
4. First aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure control/personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

Warning Labels

Each container, including secondary containers, of toxic substances shall be properly labeled. The warning labels used for hazardous materials shall contain the following information:

- Product identification/ingredient disclosure
- Pictograms (See chart below)
- Signal word
- Hazard statement(s)
- Precautionary statements
- Supplier identification

	Flame Over Circle • Oxidizers		Flame • Flammables • Self Reactives • Pyrophorics • Self-Heating • Emits Flammable Gas • Organic Peroxides		Exploding Bomb • Explosives • Self Reactives • Organic Peroxides
	Skull and Crossbones • Acute toxicity (severe)		Corrosion • Corrosives		Gas Cylinder • Gases Under Pressure
	Health Hazard • Carcinogen • Respiratory Sensitizer • Reproductive Toxicity • Target Organ Toxicity • Mutagenicity • Aspiration Toxicity		Environment • Environmental Toxicity		Exclamation Mark • Irritant • Dermal Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract • Hazardous to Ozone Layer

Employees Training

Each employee who works with or is potentially exposed to hazardous materials shall receive initial training on the HazCom/GHS Standard and the safe use of those hazardous materials. Training shall be conducted by the General Foreman/Foreman or Safety Department and shall include the following:

- Methods that may be used to detect a release of hazardous materials in the workplace
- The physical and health hazard associated with chemicals
- Protective measures to be taken
- The safe practices, emergency responses and use of personal protective equipment
- Information on the HazCom/GHS Standard including labeling, markings and an explanation of SDSs.

Silica Dust Exposure

Crystalline silica is found in concrete, masonry, sandstone, rock, paint, and other abrasives. It can also be in soil, mortar, plaster, and shingles. The cutting, breaking, crushing, drilling, grinding, or abrasive blasting of these materials may produce fine silica dust.

Airborne silica dust becomes trapped in the lungs during normal breathing. Even dust that is not visible can cause harm. As dust builds up in the lungs the damage can make breathing more difficult.

Working in any dusty environment where crystalline silica is present can increase the chance of getting silicosis.

Performing any of the following tasks are at risk for breathing silica dust:

- Abrasive blasting of concrete or using silica sand.
- Chipping, hammering, drilling sawing, or grinding of rock, concrete, or masonry.
- Crushing, loading, hauling and dumping rock.
- Dry sweeping or pressurized air blowing of concrete or sand dust.
- Jackhammering on various materials.
- Removing paint and rust with power tools.
- Rock crushing (for road base).
- Rock drilling.
- Sand and gravel screening.
- Stone cutting (sawing, abrasive blasting, chipping, grinding).

Preventing Silicosis

The key to preventing silicosis is to prevent dust from being in the air. A simple control may work, such as a water hose to wet dust down at the point of generation. Respirators should only be used after dust controls are in place and prove ineffective. Respirators shall not be the primary method of protection.

Ensure that employees practice good personal hygiene at the work place:

- Do not eat or use tobacco products in dusty areas.
- Wash hands and face before eating, drinking, or smoking outside dusty areas.
- Park vehicles where they will not be contaminated with silica.
- Change into disposable or work clothes at the work site.
- If possible change into clean clothes before leaving the worksite to prevent contamination of other areas, cars, and homes.

For further information refer to the J.F. Electric, Inc. Silica Dust Procedure.

Bloodborne Pathogens

1. Precautions shall be observed to prevent contact with blood, body fluids or other potentially infection materials.
2. All Blood or potentially contaminated materials shall be considered infectious.
3. Safe work practice controls shall be used to eliminate or minimize exposure to employees. Where exposure remains after implementing these controls, employees are required to wear PPE.
4. All blood or potentially contaminated materials shall be considered infectious.
5. An exposure incident shall be reported to the Safety Department, immediately.
6. Disposable latex gloves shall be worn when any potential exposure incident occurs.
7. Pocket breathing masks shall be used when performing mouth-to-mouth CPR.
8. Eye protection shall be worn when providing first aid to a bleeding victim.
9. All garments penetrated by blood are to be removed immediately, or as soon as possible.
10. All infectious material shall be disposed of in a biohazard bag, provided in the Bloodborne Pathogen Kit.
11. Employees shall wash their hands and any other exposed area of skin with soap and water following emergency medical treatment.
12. Clean and disinfect all equipment and work surfaces potentially contaminated with blood or other potentially contaminated material.
13. Employees shall not eat, drink, smoke, apply cosmetics, etc. in areas where exposure to infectious materials may occur.
14. Use disposable latex gloves and other PPE when cleaning up spills. Wipe up spills with paper towels or other absorbent material. After the area has been wiped clean, wash the area with a solution of ¼ cup liquid bleach to 1 gallon of water.

*See Bloodborne Pathogen Procedure in the Safety Procedures for additional information.

Medical Services, First Aid and CPR

1. J. F. Electric's Safety Representative or Foreman shall determine the closest medical treatment center to the job and post the phone number of the ambulance service.
2. If a medical facility is not available within 15 minutes of a job site, at least two employees on the job site shall be trained in first aid treatment, and CPR.
3. First aid supplies shall be available and maintained current on all job sites. The supplies shall be maintained in a waterproof container with individual sealed packages for each type of item. The contents of the kit shall be evaluated weekly by the Foreman or Safety Department and stocked as needed.
4. A vehicle and driver shall be designated on each job to transport injured employees to the doctor. A phone shall be available to contact the ambulance service.
5. Phone numbers for the medical facility and ambulance service shall be conspicuously posted at all phones on the job site. In remote areas, a mobile phone shall be provided to contact the nearest medical facility or ambulance service.

6. Water or eye wash facilities for the emergency flushing of the eyes and body shall be available and designated where corrosive materials are being used. Where corrosive materials are not present, this shall not apply.

Process Safety Management Program

The purpose of this Process Safety Management Program is to prevent or minimize the consequences of catastrophic release of toxic, reactive, flammable or explosive chemicals on site in one location, in quantity of 10,000 pounds or more.

A facility where a highly hazardous chemical is being produced or handled shall provide or develop and implement safe work practices/procedures and provide these documents and training material/procedures to J. F. Electric, Inc. Everyone working at that facility shall be trained before commencing any work.

It is the responsibility of J. F. Electric, Inc. to ensure that our personnel have received proper safety training as outlined from the owner prior to commencing work and prior to any new personnel arriving on a site where this type of process is in place. All safety training shall be documented.

Wireless Communication Devices (WCDs) While Working

WCDs shall not be used while performing work, unless used for the job being performed (example: communicating while pulling wire).

Office Safety

- Chairs, waste baskets, cords and other articles shall not be left in aisles or where they could cause a tripping hazard.
- Desk and file drawers, cabinet doors, and slides shall not be left standing open while unattended.
- Only one drawer of a multi-drawer file cabinet shall be open at a time.
- Broken glass or other sharp edge objects shall not be placed in waste baskets unless properly protected.
- Approved stepladders or other safe supports shall be used to reach material on high shelves or at other elevated positions.
- On stairways employees shall take one step at a time, using the handrail and not run.
- Employees shall guard against overbalancing filing cabinets. Where possible, filing cabinets shall be bolted together or otherwise secured.
- Employees shall not over extend leaning back on chairs to avoid falling backwards.
- Pins, razor blades and other sharp objects required for office type work shall be kept in a special drawer compartment, container or otherwise safely protected.
- Where guards are provided for moving parts, employees shall be sure they are in place before starting the machine.
- When chemical use is required for office tasks, the chemicals shall be stored in proper containers with proper label and any harmful exposures shall be identified before use and steps taken to eliminate said exposures.
- Storage areas are to be kept neat and orderly.
- Stairwells and aisles shall be kept clear.
- Isles, fire extinguishers and alarms and other walkways shall be kept unobstructed.
- Any spills on hard surfaced floors shall be cleaned up immediately.
- Always enter and exit an elevator facing forward and step over the door threshold.
- The handle of large paper cutters shall be kept in the down position when not in use.
- Label defective equipment with a description of the problem.

Computer Use Ergonomics

- Sit with correct posture: back supported, head upright and arms hanging loosely at your sides with elbows bent near 90 degrees.
- Face the computer monitor and avoid twisting.
- Do not work with your wrists or arms resting on a hard or sharp edge.
- When using the keyboard, do not bend wrists upward. Try to work with wrists in a neutral position or slightly bend downward.
- Keep your monitor within an arm's length (18"-28") away from your eyes. Eyes should look level with the Windows toolbar.
- When continuously using a computer, it is good practice to take a two or three minute micro break about every half hour. Shake muscles loose and focus on an object several feet away to help re-adjust eyes.

Section II: Utility Line Department

Internal Reporting Procedure: Personal Injury/Vehicle/ Property/Near Miss

1. Secure personnel and scene – CALL 911 if required
2. Employee immediately inform Foreman
3. Foreman immediately contact General Foreman.
4. General Foreman contact Operations Manager, the Operations Manager is to contact the Vice President of Operations, and The Head of the Safety Department.
5. Employee, Foreman/General Foreman/Safety Representative/Operations Manager prepare appropriate report, take photos and submit to Safety Department within 24 hours.
6. Safety Representative contact Vice President of Operations, Head of the Safety Department, Operations Manager, Superintendents, General Foreman as required and Claims Department for any injury.
7. Safety Representative coordinate completion of incident investigation and interface with Utility Line Department and Claims Department.
8. Safety Representative coordinate interface with Utility Line Department and Claims Department for employee return to work (including light duty assignments) approvals as required.
9. Drug test the employee anytime an incident is reported. (Examples):
 - a) personal injury
 - b) vehicle damage
 - c) property damage
10. No one is to talk to the media. Refer all media inquiries to the Claims Department at 618-797-5278

Utility Line Department Daily Job Briefings

In addition to the weekly toolbox safety meetings, Foremen shall be required to conduct a job briefing at the beginning of their work day, after lunch and whenever the job changes significantly. This briefing shall be held with all employees at the job site prior to the start of work and shall cover:

- Hazards associated with the job
- Work procedures involved
- Special precautions
- Energy source controls
- Personal protective equipment
- Notify crew of nearest medical facility and location of First Aid kits and fire extinguishers

At the end of the day, each employee on the crew shall affirm on the job briefing sheet that they were not injured or involved in an incident on the job during the work day.

These briefings shall be documented and sent to the Safety Department.

An effective accident prevention and health hazard control program is based on job performance. When people are trained to do their jobs properly, they will do them safely. Continued employee participation in training shall ensure continuing safety. Employee participation includes paying attention, mastering the material, asking questions, and applying the training to day-to-day activities.

Utility Company Information Exchange

Before work begins, the utility company shall inform J.F. Electric, Inc. of the following, related to the safety of the work to be performed:

- The nominal voltages of line and equipment
- The maximum switching-transient voltages
- The presence of hazardous induced voltages
- The presence of protective grounds and equipment grounding conductors
- The locations of circuits and equipment, including electric supply lines, and fire-protective signaling circuits
- The condition of protective grounds and equipment grounding conductors
- The condition of poles
- Environmental conditions relating to safety

J.F. Electric, Inc. shall provide this information to all employees and subcontractors on the job site.

J.F. Electric, Inc. shall advise the utility company of any unanticipated hazardous conditions found during the work. This shall be relayed to the utility company within two (2) days after discovering the hazardous condition.

Personal Protective Equipment (PPE)

1. *Hard Hats and safety glasses with side shields* shall be worn at all times except when inside an enclosed cab.
2. *On all aerial platform equipment:* Hard hat, safety glasses with side shields and safety harness properly installed and secured shall be worn at all times.
3. *When working distribution structures located within the minimum approach distance of energized distribution conductor(s) and/or apparatus from aerial platform equipment:* The following PPE shall be required: hard hat, safety glasses with side shields, safety harness properly installed and secured, appropriate FR/AR apparel per company, union, and/or individual utility company requirements, and, depending on the voltage, insulated Class 2 or 4 rubber gloves and sleeves or Class "0" rubber gloves. These insulated rubber goods shall be worn cradle-to-cradle. Once the employee has effectively and completely covered all conductors and isolated all ground source potentials, the employee may remove their rubber gloves to perform a minute task only for the time it takes to perform that task. At no time is the employee to remove their rubber gloves if within the minimum approach distance (table 1).
4. *When working from a distribution structure located within the minimum approach distance of energized distribution conductor(s) and/or apparatus:* The following PPE shall be required: hard hat, safety glasses with side shields, appropriate FR/AR apparel per company, union, and/or individual utility company requirements, and, depending on the voltage, insulated Class 2 or 4 rubber gloves and sleeves or Class "0" rubber gloves. These insulated rubber goods shall be worn when within the minimum approach distance. Once the employee has effectively and completely covered all conductors and isolated all ground source potentials, the employee may remove their rubber gloves to perform a minute task only for the time it takes to perform that task. At no time is the employee to remove their rubber gloves if within the minimum approach distance (table 1).
5. *Lock to Lock insulated rubber goods:* When employees are working on URD energized primary conductor(s) and/or apparatus Class 2 or 4 rubber gloves and sleeves shall be worn "lock- to-lock" when employees are working on URD energized secondary conductor(s) and/or apparatus, Class "0" rubber gloves shall be worn "lock-to-lock". The term "Lock-to-Lock" is used to describe the utilization of the rubber goods prior to the time the equipment is unlocked or opened, until work is complete and the equipment is relocked or closed.
Class 2 or 4 rubber gloves and sleeves shall be worn when working on or within the extended reach of the conductor and/or apparatus. The term "extended reach" is used to describe being within five feet of energized conductor(s) and/or apparatus or having a conductive object within five feet of energized conductors and/or apparatus.

Note:

- Fire resistant (FR)/arc resistant (AR) shirts, worn as the outer most protection, shall be long sleeve and worn during the entire work day at JF Electric. The

sleeves shall be rolled down and buttoned, completely buttoned up the front with the shirt tails tucked in to the trouser waist.

- Arc resistant face shields shall be required when making energized 3 phase secondary and any primary hot taps/connections and during overhead and underground switching operations. Face shields shall be worn when opening underground transformers and whenever working live front pad-mount transformers.
6. *Reflective/Fluorescent vests/outerwear:* All employees who may be exposed to vehicular or moving equipment hazards shall wear an ANSI approved reflective/fluorescent vests/outerwear. This apparel shall be worn anytime you are out of the vehicle, night or day, and are exposed to traffic or moving equipment. The following specific examples warrant the wearing of this apparel (list is not all-inclusive):
- a) Flagging
 - b) Setting up or taking down a traffic control zone
 - c) Construction/maintenance activity on, or within 15 feet of an active road, street or parking lot.
 - d) Other tasks including, but not limited to, locating underground utilities and inspecting crews that are on or within 15 feet of an active road, street or parking lot
 - e) Working from (getting tools, instruments, materials, equipment) a vehicle parked on, next to or within 15 feet of an active road, street or parking lot.
 - f) Construction/maintenance activity conducted with an active work zone where moving construction equipment or traffic is present.
7. *When climbing wooden poles:* A wood pole fall protection system (FPS) is required to be used when climbing a wood pole. Every lineman shall be issued and trained to use a wood pole FPS. The device shall be used whenever a climber is on a pole four (4) or more feet above the grade. A climber is not allowed to free climb except for providing pole top rescue.

*See Wood Pole Fall Protection Policy in the Safety Procedures for additional information.

Utility Line Department Disciplinary Policy

The following progressive discipline shall be administered for violations:

- 1st Violation: Written warning
- 2nd Violation: Immediate removal from the job and three (3) day suspension
- 3rd Violation: Immediate removal from the job and dismissal. Employee may not be eligible for rehire up to one (1) year.

Note: Certain violations may be deemed serious enough to warrant immediate suspension or dismissal. J.F. Electric, Inc. is not bound to follow the progressive discipline in those instances.

The following violations at a minimum, shall warrant immediate suspension: Any employee in violation of the following shall be immediately suspended. Any employee in a supervisor capacity to include: Safety Representatives, Manager, Superintendent or General Foreman who observes a violation and does not take immediate action to implement this policy shall be subject to immediate suspension themselves.

- Not wearing a hard hat
- Not wearing safety glasses with side shields
- Not documenting the job briefing
- Not wearing Class 2 or 4 rubber gloves and sleeves or Class "0" rubber gloves
- Not properly grounding/barricading aerial equipment
- Not wearing reflective/fluorescent vest/outerwear

This policy is a modification of the existing JF Electric Disciplinary Policy (In the All Departments Section of this manual), and defines more stringent penalties based on the nature of the work being performed. Please consult your supervisor immediately if you have any questions as to the requirements you are expected to follow.

Cranes and Other Lifting Equipment

Some work may be too high, and some loads too large to manage without specialized equipment. Employees may be called upon to use an aerial platform or other similar equipment to reach a work area, or assigned to operate cranes, pickers, or other approved lifting equipment.

Except where electrical equipment has been de-energized and visibly grounded at a point of work, or where correctly insulated barriers have been installed to prevent contact with the conductors, no part of a crane or its load shall be operated by a qualified lineman within 3 feet of a conductor rated up to 50 kv. Over 50 kv shall be twice the length of the line insulator – NEVER LESS THAN 10 FEET.

Heavy Equipment

All heavy equipment shall be maintained in accordance with manufacturer specifications and OSHA requirements. An inspection of heavy equipment shall be conducted by a J. F. Electric mechanic prior to delivery at a job site.



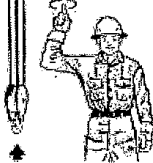
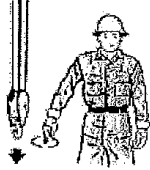
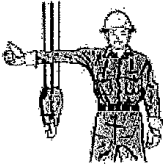
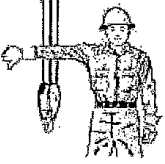
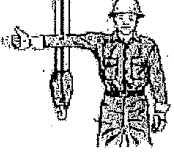
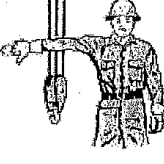


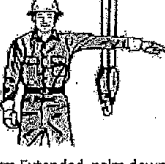

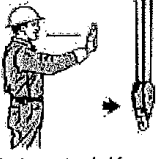

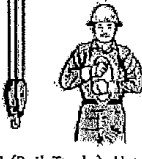





Employees operating heavy equipment shall be qualified, familiar with its operation and safety features and responsible for inspecting the equipment before use.

A thorough PMI inspection shall be conducted by a J. F. Electric mechanic or other authorized mechanic on a regular basis. Inspection documentation shall be maintained in the equipment file. Modifications to heavy equipment shall be made only upon the written recommendation of the manufacturer, with all related documents being retained in the appropriate file.

Leased or rented pieces of heavy equipment shall not be offloaded unless copies of required inspections are delivered along with the equipment. This information shall be kept at the job site, with copies sent to the corporate offices for inclusion in the equipment file.

Hand Signals

Hand signals shall be consistent. Communicate the signals you will be using with a new crane or picker operator. If possible, compare your hand signals with the ones posted in the cab of the crane or other lifting device.

 <p>USE MAIN HOIST - Tap fist on head, then use regular signals.</p>	 <p>USE WHIPLINE - (Auxiliary Hoist) Tap elbow with one hand, then use regular signals.</p>	 <p>HOIST - With forearm vertical, forefinger pointing up, move hand in small horizontal circle.</p>	 <p>LOWER - With arm extended downward, forefinger pointing down, move hand in small horizontal circles.</p>
 <p>RAISE BOOM - Arm extended, fingers closed, thumb pointing upward.</p>	 <p>LOWER BOOM - Arm Extended, fingers closed, thumb pointing downward.</p>	 <p>RAISE THE BOOM & LOWER THE LOAD - With arms extended, thumb pointing up, flex fingers in and out as long as load movement is desired.</p>	 <p>LOWER THE BOOM & RAISE THE LOAD - With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.</p>
 <p>DOG EVERYTHING - Clasp hands in front of body.</p>	 <p>SWING - Arm extended point with finger in direction of swing of boom.</p>	 <p>STOP - Arm Extended, palm down, hold position rigidly.</p>	 <p>EMERGENCY STOP - Arm extended, palm down, move hand rapidly right and left.</p>
 <p>TRAVEL - Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.</p>	 <p>MOVE SLOWLY - Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example)</p>	 <p>TRAVEL (Both Tracks) - Use both fists in front of body, making a circular motion about each other, indicating direction of travel: forward or backward. (For crawler cranes only)</p>	 <p>TRAVEL (One Track) - Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist, rotated vertically in front of body. (For crawler cranes only)</p>
 <p>EXTEND BOOM (Telescoping Booms) - Both fists in front of body with thumbs pointing outward.</p>	 <p>RETRACT BOOM (Telescoping Booms) - Both fists in front of body with thumbs pointing toward each other.</p>	 <p>EXTEND BOOM (Telescoping Boom) - One hand signal. One fist in front of chest with thumb tapping chest.</p>	 <p>RETRACT BOOM (Telescoping Boom) - One hand signal. One fist in front of chest thumb pointing outward and heel of fist tapping chest.</p>

Operators Responsibilities

- Daily inspections are completed prior to use.
- Appropriate load charts are provided and available for each configuration.
- The person in charge shall ensure ground conditions are adequate to support the weight of the crane and anticipated load. Ground conditions are to be documented on the pre-job briefing when performing a critical lift, ground conditions shall be documented on the Critical Lift Plan form as well as the job briefing.
- The person in charge shall designate an assembly and disassembly director. The assembly and disassembly director (A/D), shall be qualified per subpart CC of the standard.
- The person in charge shall ensure the implementation and use of fall protection during assembly and disassembly operations.
- Load chart ratings are not exceeded.
- Functional tests are performed.
- The crane has a current annual inspection.
- Loads do not exceed the capacity of the crane.
- The crane maintains a safe distance from power lines.
- The super structure swing radius is properly barricaded.
- Every crew member understands and can identify the stop signal.
- One certified signal person has been identified for the lift.
- Outrigger pads are placed under each outrigger.
- All factors reducing capacity have been evaluated.
- Load Moment Indicators (LMI) are only aids, never use the LMI in place of a load chart. Always refer to the load chart prior to each lift to ensure the load is within the capacity of the crane.

Additional Requirements

- Critical lift plans shall be submitted upon request for review, prior to the critical lift.
- An annual Crane Safety Certification for each crane shall be on file. A preventative maintenance schedule for wire rope, slings, etc. shall be maintained and records made available upon request.
- All crane operations shall be in accordance with ASME/ANSI. B30.5 and the Crane Institute of America or similar standards.
- All crane operations shall have the required number of ground support personnel (i.e. signal men).
- An audible device may be used to alert employees of a pick.
- Outrigger mats shall be at least two times the size of the affixed outrigger pad.
- Accessible areas within the swing radius of the rear of the rotating crane, either permanently or temporarily mounted, shall be barricaded in such a manner as to prevent anyone from being struck or crushed by the crane.
- No person shall be under a suspended load or inside the angle of a hoist line.
- No person shall stand or work near a cable, chain or rope under tension.

- Operators shall not leave their position at the controls of cranes, or other lifting devices while the load is suspended.
- When making a lift outside of the operators' visual site, the operator and signaler shall maintain communication.
- Hoisting of employees on a suspended work-platform/man-basket with a crane is prohibited, except when conventional means of reaching the work site would be more hazardous or is not possible because of workplace conditions. In the event a crane suspended work platform must be utilized, compliance with 29 CFR 1926.550(g) shall be met.
- No person shall be permitted to ride the hook, sling or load of any hoisting equipment.
- Load limits, as specified by the manufacturer, shall not be exceeded under any circumstances.
- An accessible fire extinguisher shall be located in the cab of the crane during crane operations.

Rigging

Rigging is an important part in safe use of a crane. All rigging shall be performed by a qualified rigger and conform to standard rigging practices. Wire rope, spliced or looped shall not be used as a sling for lifting.

- All rigging shall be inspected prior to each use. Rigging found with damage or excessive wear shall be taken out of service and removed from job site immediately.
- All rigging (come-a-longs, hoists, slings, chokers, etc.) used for lifting, pulling, setting, etc. shall have the load capacity clearly marked as provided by the manufacturer or engineer.
- Specialty rigging (i.e. spreader bars, slings, hooks, etc.) shall have the appropriate documentation including as to the engineer's drawing and engineer's seal and a copy of the documentation shall be maintained in JF Electric's office until the rigging leaves the facility.
- All sling and crane load line hooks shall have safety latched installed or shall be moused. (This does not apply to specialty slings and hooks, such as sorting or shake out slings or self-adjusting pipe slings.) Specialty slings and hooks shall not be used to set steel or move materials over workers.
- Specialty hooks (i.e. sorting hooks) shall only be used as recommended by the manufacturer.
- The use of nylon/synthetic slings on structured steel is prohibited unless softeners are provided.
- All slings shall be protected from damage on sharp corners.

Critical Lift Plan

Objective:

The Critical Lift Plan was developed to assure that an in-depth evaluation and planning of all heavy and/or complicated lifts is completed before the lift is attempted.

Definitions:

Critical Lift: A critical lift has one or more of the following conditions.

- a) Load is over 75% of the rated capacity for current configuration.
- b) Load is more than 20 tons.
- c) Lift is over operating systems (energized equipment, above grade pipelines, etc.)
- d) Lift requires the use of two (2) or more lifting devices

General Foreman: The person who is responsible for the daily construction activities at the site of the project.

Foreman: The person responsible for directing the critical lift.

Crane Operator: The person that will be operating the lifting device and making the lift.

Qualified Rigger: The person responsible for planning and execution of the rigging that is being used for the critical lift.

Safety Professional: The site Safety Representative.

Requirements:

The General Foreman shall complete the "Critical Lift Plan" form. The plan shall include the following information: (See Critical Lift Plan Form.)

- a) Size, weight, and configuration of component being lifted.
- b) Lifting device to be used to make the lift with capacity charts showing capacity and radius from center pin of crane.
- c) Elevation of lifting device pad.
- d) Drawings necessary to describe the lift and rigging being used for the lift.
- e) Company names of other contractors working in the area of the lift.

A review of the "Critical Lift Plan" shall be performed at the site of the lift just prior to making the lift. This review shall include the following:

- a) Critical Lift Plan documentation.
- b) Safety precautions necessary for all employees in the area, including personnel employed by other contractors.
- c) Review of aerial lift inspection and maintenance documentation to be assured they are current.
- d) A job briefing including all employees involved in making the lift.
- e) The briefing of all other contractors who have employees working within the area, if any

Critical Lift Plan Form

Project Name: _____ Project _____
 Location: _____ Date: _____
 Company: _____
 Submitted By: _____

5. Crane Manufacture:	6. Model Number:	7. Crane Inspection Date:	8. Weather Conditions:
9. Description Of Load:	10. Boom Length:	11. Boom Angle: PICK: SET:	12. Will Jib Be Used? <input type="checkbox"/> YES <input type="checkbox"/> NO
13. Jib Length:	14. Offset/Type To #	15. Maximum Operating Radius:	16. Degree Of Swing:
17. Crane Manufactures Rated Capacity:	18. Is lift near an airport	19. Air Study Complete	20. Wind Speed and Direction

Classification (check all that apply)
 Load is over 75% of the crane's rated capacity for current configuration
 More than 20 tons
 Lift is over operating systems (charged electrical equipment, above grade pipelines, etc.)
 Lift uses two (2) or more cranes

SIGNATURES	
General Foreman: _____	Foreman: _____
Crane Operator: _____	Safety Professional: _____
Qualified Rigger: _____	Qualified Signal Person: _____
PRE-LIFT MEETING ATTENDEES SIGNATURES	
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

A. WEIGHT			B. JIB		
1. Weight of Equipment		Lbs.	<input type="checkbox"/> Erected	<input type="checkbox"/> Stowed	
2. Weight of Headache Ball		Lbs.	1. Length of Jib		Ft.
3. Weight of Load Block		Lbs.	2. Angle of Jib		Deg.
4. Weight of Lifting Bar		Lbs.	3. Rated Capacity of Jib (From Chart)		Lbs.
5. Weight of Slings and Shackles		Lbs.	C. SIZING OF SLINGS/SHACKLES		
6. Weight of Jib		Lbs.	1. Sling Selection:		
7. Weight of Cable (Load Fall)		Lbs.	a. Type of Arrangement		
8. Allowance for Unaccounted Material in Equipment (10% of Equip. Weight)		Lbs.	b. Number of Slings in Hookup		
			c. Certification Attached or Number		
9. No. of People Lifted x 250 lbs.		Lbs.	d. Sling Length		Ft.
10. Other		Lbs.	e. Rated Capacity of Slings		Lbs.
TOTAL WEIGHT			Lbs.	2. Shackle Selection:	
			a. Capacity (Tons)		
Source of Load Weight:			b. Shackles Attached to Load By:		
(Name Plate, Drawings, Calculated)			c. Number of Shackles		
Weight Verified By:			d. Certification Attached or Number		
Pre-Job Briefing Conducted:					
D. CRANE			E. CRANE PLACEMENT		
1. Type of Crane			1. Smooth Solid Foundation in Area?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Crane Capacity		Lbs.	If No Explain:		
3. Lifting Arrangement					
a. Max. Distance Center Load to Center Pin		Ft.			
b. Length of Boom		Ft.			
c. Angle of Boom at Pickup		Deg.	2. Electrical Hazards in Area?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
d. Angle of Boom at Set		Deg.	If Yes Explain:		
4. Rated capacity of crane under most severe lifting conditions:					
a. Over Rear		Lbs.	3. Obstructions/Obstacles to Lift/Swing?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
b. Over Front		Lbs.	If Yes Explain:		
c. Over Side		Lbs.			
5. Rated Capacity of Crane for Lift		Lbs.	4. Above Grade Piping/Cables?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6. Max. Load on Crane		Lbs.	If Yes Explain:		
7. Lift is % of Crane's Rated Capacity					

PRE-LIFT CHECK LIST				
1. Matting Acceptable?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	7. Tag Line Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Outriggers Fully Extended?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	8. Experienced Operator?	<input type="checkbox"/> Yes <input type="checkbox"/> No

3. Crane in Good Condition?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	9. Experienced Flagman Designated?	<input type="checkbox"/> Yes <input type="checkbox"/> No
4. Adequate Swing Room?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	10. Experienced Rigger?	<input type="checkbox"/> Yes <input type="checkbox"/> No
5. Head Room Checked?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	11. Load Chart in Crane?	<input type="checkbox"/> Yes <input type="checkbox"/> No
6. Maximum Counterweight Used?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	12. Pre-Job Briefing Completed?	

13. Crane Inspected By:	Date:
-------------------------	-------

14. Functional Test of Crane By:	Date:
----------------------------------	-------

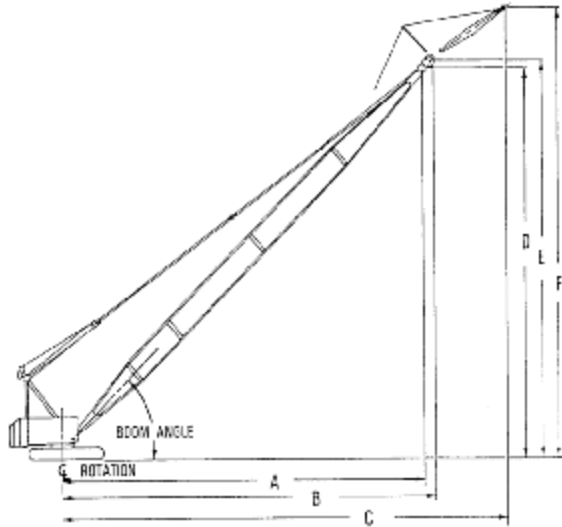
DIAGRAM CRANE AND LOAD PLACEMENT (Draw in space below, or attach copy)	DIAGRAM RIGGING CONFIGURATION (Draw in space below, or attach copy)

DISCRIPTION OF PRODUCT BEING LIFTED-Transformer, H Structure, ETC.:

- MULTIPLE CRANE LIFTS REQUIRE A SEPARATE LIFT PLAN FOR EACH CRANE.
- ANY CHANGES IN THE CONFIGURATION OF THE CRANE, PLACEMENT, RIGGING, LIFTING SCHEME, ETC. OR CHANGES IN ANY CALCULATIONS REQUIRE THAT A NEW LIFT PLAN BE DEVELOPED

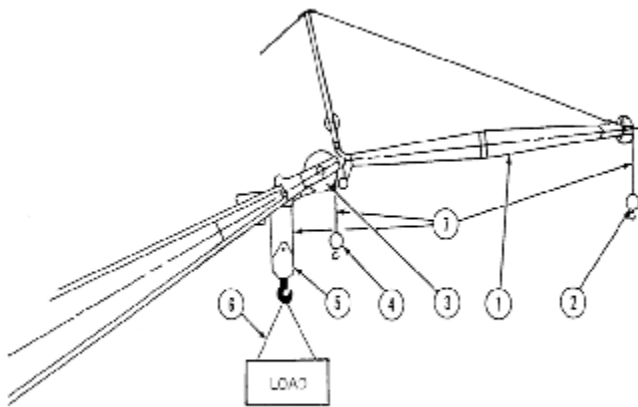
Capacity Chart Guideline

CAPACITY CHART GUIDELINE





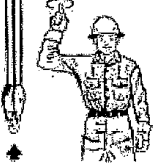
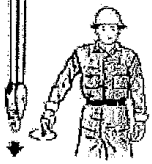
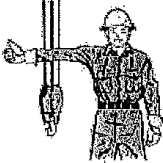
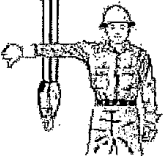
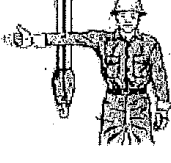
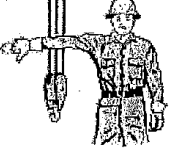

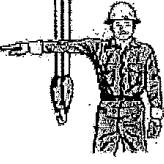
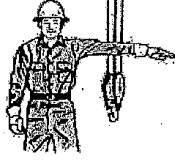
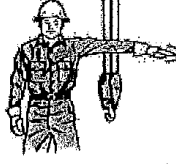
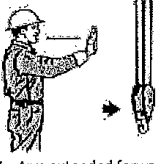

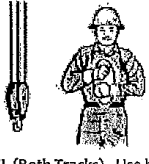





A - Operating Radius - Main Load Line (Lower Boom Point)	_____	Ft.
B - Operating Radius - Whip Line (Upper Boom Point)	_____	Ft.
C - Operating Radius (Jib Point)	_____	Ft.
D - Boom Point Elevation - Main Load Line (Lower Boom Point)	_____	Ft.
E - Boom Point Elevation - Whip Line (Upper Boom Point)	_____	Ft.
F - Jib Point Elevation - Jib Line (Jib Point)	_____	Ft.

GUIDE FOR DETERMINING TOTAL ERECTION LOAD



1. Jib (see "Deduct From Capacities" on capacity chart)	_____	Lbs.
2. Weight Ball and Hook (jib point)	_____	Lbs.
3. Upper Boom Point (from capacity chart if noted)	_____	Lbs.
4. Weight Ball and Hook (upper boom point)	_____	Lbs.
5. Load Block	_____	Lbs.
6. Total Weight Wire Rope Beneath Lower, Upper and Jib Point (see "Load Line Specifications" for weight of wire rope per ft.)	_____	Lbs.
7. Slings	_____	Lbs.
8. Shackles	_____	Lbs.
9. Spreader Bar(s)	_____	Lbs.
10. Weight of Other Miscellaneous Rigging	_____	Lbs.

Hand Signal Chart

 <p>USE MAIN HOIST - Tap fist on head, then use regular signals.</p>	 <p>USE WHIPLINE - (Auxiliary Hoist) Tap elbow with one hand, then use regular signals.</p>	 <p>HOIST - With forearm vertical, forefinger pointing up, move hand in small horizontal circle.</p>	 <p>LOWER - With arm extended downward, forefinger pointing down, move hand in small horizontal circles.</p>
 <p>RAISE BOOM - Arm extended, fingers closed, thumb pointing upward.</p>	 <p>LOWER BOOM - Arm Extended, fingers closed, thumb pointing downward.</p>	 <p>RAISE THE BOOM & LOWER THE LOAD - With arms extended, thumb pointing up, flex fingers in and out as long as load movement is desired.</p>	 <p>LOWER THE BOOM & RAISE THE LOAD - With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.</p>
 <p>DOG EVERYTHING - Clasp hands in front of body.</p>	 <p>SWING - Arm extended point with finger in direction of swing of boom.</p>	 <p>STOP - Arm Extended, palm down, hold position rigidly.</p>	 <p>EMERGENCY STOP - Arm extended, palm down, move hand rapidly right and left.</p>
 <p>TRAVEL - Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.</p>	 <p>MOVE SLOWLY - Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example)</p>	 <p>TRAVEL (Both Tracks) - Use both fists in front of body, making a circular motion about each other, indicating direction of travel: forward or backward. (For crawler cranes only)</p>	 <p>TRAVEL (One Track) - Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist, rotated vertically in front of body. (For crawler cranes only)</p>
 <p>EXTEND BOOM (Telescoping Booms) - Both fists in front of body with thumbs pointing outward.</p>	 <p>RETRACT BOOM (Telescoping Booms) - Both fists in front of body with thumbs pointing toward each other.</p>	 <p>EXTEND BOOM (Telescoping Boom) - One hand signal. One fist in front of chest with thumb tapping chest.</p>	 <p>RETRACT BOOM (Telescoping Boom) - One hand signal. One fist in front of chest thumb pointing outward and heel of fist tapping chest.</p>

Traffic Control at Work Sites

Minimum Requirements

The Foreman shall assess the traffic and roadway conditions and select the appropriate safety measures by utilizing the Manual of Uniform Traffic Control Devices (MUTCD) and exercising good judgment and considering:

- Amount of traffic flow
- Speed of traffic flow
- Terrain
- Road Conditions
- Visibility

Additional precautions such as additional light, cones, and/or additional signs shall be utilized at night.

Other devices, including flaggers, may be added to supplement the minimum requirements and device spacing may be adjusted to provide additional reaction time for motorists. The use of law enforcement personnel to close a roadway is a substitute for all minimum requirements.

Flaggers

- Shall be trained
- Shall wear a highly visible vest/outerwear with reflective/fluorescent properties
- Shall use either a stop/slow paddle or reflective/fluorescent flag
- Shall stand alone
- Shall not stand near equipment or vehicles
- Shall stand at the edge of the roadway
- Shall not leave their post unless properly replaced

Cones

- Shall be at least 28" high and equipped with reflective material
- Shall be made to remain upright
- Spacing shall meet the MUTCD requirements.

Truck Warning Lights

- Shall be used during the day and at night

Traffic Signs

- Construction areas shall be posted with legible traffic signs at points of hazard
- All traffic control signs or devices used for protection of construction workers shall conform to Part VI of the MUTCD. Traffic signs shall be spaced according to the MUTCD requirements.
- Traffic signs shall be made to remain in an upright position.

High Voltage/Utility Work

General Requirements

When work is being performed on or near energized transmission and distribution conductor(s) and apparatus, ALL rules pertaining to protection from electric shock SHALL be observed.

Qualified Persons (those permitted to work on or near exposed energized parts) shall be at a minimum, trained and familiar with the following:

1. Skills and techniques necessary to distinguish exposed energized parts from other parts of the electric equipment
2. Skills and techniques necessary to determine the nominal voltage of exposed energized parts.
3. Skills and techniques necessary to determine the minimum approach distances corresponding to the voltages to which the Qualified Person will be exposed.

A Qualified Observer is needed:

- Anytime an employee(s) are within extended reach (5ft) of energized conductors and/or equipment, or having a conductive object within 5 feet of energized conductors and/or equipment.

The Qualified Observer shall:

- Observe work practices to ensure clearances are maintained.
- Observe proper PPE and effective cover up is installed and used.
- Be Identified/documented during the job briefing.
- Not have any other duties and/or tasks while functioning as the Qualified Observer.

Qualified Observer Requirements:

- Shall be capable of performing the proper rescue procedures that the job may require in the event of an incident.
- Identifying nominal voltages, energized components, and minimum approach distances.
- Identify proper safe work practices while employees are working on and/or near energized conductors and/or equipment.

Initial inspections, tests, or determinations

1. Existing conditions shall be determined before starting work, by an inspection or a test. Such conditions shall include, but not be limited to, energized conductor(s) and equipment, conditions of poles, and the location of conductor(s) and equipment, including power and communication lines, CATV and fire alarm circuits.
2. Electric equipment and conductor(s) shall be considered energized until determined to be de-energized by tests or other appropriate methods or means and grounded.
3. Operating voltage of equipment and conductor(s) shall be determined before working on or near energized parts.

Protection from electric shock

No employee shall be permitted to approach or take any conductive object, without an approved insulating handle, closer to exposed energized parts than shown in Table 1, unless:

1. The employee is insulated or guarded from the energized part (Class "0" rubber gloves or Class 2 or 4 rubber gloves and rubber sleeves rated for the voltage involved shall be considered insulation of the employee from the energized part), or
2. The energized part is insulated or guarded from the employee and from any other conductive object at a different potential, or
3. The employee is insulated or guarded from any other exposed conductive object(s)

The minimum working distance and minimum clear hot stick distances stated in Table 1 shall not be violated. The minimum clear hot stick distance is that for the use of live-line tools held by linemen when performing live-line work.

Conductor support tools, such as link sticks, strain carriers, and insulator cradles, may be used: provided, that the clear insulation is at least as long as the insulator string or the minimum distance specified in Table 1 for operating voltage.

Note: Even though Class "0" rubber gloves or Class 2 or 4 rubber gloves and rubber sleeves are required, appropriate cover up-such as rubber blankets, rubber line hose, pole guards, etc. shall also be used. Additionally, Class 2 or 4 rubber gloves and rubber sleeves are to be worn when setting poles within the minimum approach distance of energized primary conductor(s) or apparatus.

Table 1

Alternating Current – Minimum Approach Distances

Nominal Voltage (kV)	Minimum approach and clear hot stick distance	
	Phase to Ground Exposure	Phase to Phase Exposure
0.05 to 0.300	Avoid Contact	Avoid Contact
0.301 to 0.75	1 ft. 1 inch	1 ft. 1 inch
0.751 to 5.0	2 ft. 1 inch	2 ft. 1 inch
5.1 to 15.0	2 ft. 2 inches	2 ft. 3 inches
15.1 to 36.0	2 ft. 6 inches	2 ft. 11 inches
36.1 to 46.0	2 ft. 9 inches	3 ft. 3 inches
46.1 to 72.5	3 ft. 3 inches	3 ft. 11 inches
72.6 to 121	3 ft. 9 inches	4 ft. 3 inches
138 to 145	3 ft. 7 inches	4 ft. 11 inches
161 to 169	4 ft. 0 inches	5 ft. 8 inches
230 to 242	5 ft. 3 inches	7 ft. 6 inches
345 to 362	8 ft. 6 inches	12 ft. 6 inches
500 to 550	11 ft. 3 inches	18 ft. 1 inch
765 to 800	14 ft. 11 inches	26 ft. 0 inches

De-energizing conductor(s) and equipment

When de-energizing conductor(s) and equipment operated in excess of 600 volts, and the means of disconnecting from electric energy is not visibly open or visibly locked out, the following shall be complied with:

1. The particular section of line or equipment to be de-energized shall be clearly identified, and it shall be isolated from all sources of voltage.
2. Notification and assurance from the designated employee shall be obtained that:
 - a) All switches and disconnects through which electric energy may be supplied to the particular section of conductor or equipment to be worked have been opened;
 - b) All switches and disconnects are plainly tagged indicating that work is being performed;
 - c) And that where design of such switches and disconnects permits, they have been rendered inoperable.
3. After all designated switches and disconnects have been opened, rendered inoperable, and tagged, visual inspection or tests shall be conducted to insure that equipment or conductors have been de-energized.
4. Protective grounds shall be applied on the disconnected conductor(s) or equipment to be worked on.
5. Guards or barriers shall be erected as necessary to adjacent energized conductor(s) or equipment.

6. When more than one independent crew requires the same conductor(s) or equipment to be de-energized, a prominent tag for each such independent crew shall be placed on the conductor(s) or equipment by the designated employee in charge.
7. Upon completion of work on de-energized conductor(s) or equipment, each designated employee in charge shall determine that all employees in his crew are clear, that protective grounds installed by his crew have been removed, and he shall report to the designated authority that all tags protecting his crew may be removed.

Emergency procedures and first aid

- The employees shall be trained on:
 - a) Procedures involving emergency situations, and
 - b) First aid fundamentals including CPR.

Night work

- When working at night, spotlights or portable lights for emergency lighting shall be provided as needed to perform the work safely.

Work near and over water

- When crews are engaged in work over or near water and when danger of drowning exists, they shall be provided personal flotation devices.

Sanitation facilities

- Drinking (bottle) water shall be provided to all employees.
- Employees shall have transportation available to nearby toilet facilities and hand washing facilities.

Hydraulic fluids

- All hydraulic fluids used for the insulated sections of derrick trucks, aerial lifts, and hydraulic tools which are used on or around energized lines and equipment shall be of the insulating type.

Rubber Goods

Employees shall verify that the test due dates have not expired on rubber goods, before use.

Rubber Gloves and Rubber Sleeves

1. When Class 2 or 4 rubber gloves are required, rubber sleeves shall also be required.
2. Class "0" rubber gloves shall not be used when working on energized conductors or apparatus above 600 volts
3. Employees shall not contact exposed energized parts operating at 50 volts or above unless:
 - The employee is insulated from the energized line or part. Insulated electrical protective equipment rated for the voltage involved such as insulated tools, and/or Class 2 or 4 rubber gloves and rubber sleeves or Class "0" rubber gloves shall be considered effective insulation for the employee from the energized part being worked on. All insulated tools shall have a voltage rating.
4. When working on energized conductors or apparatus, Class 2 or 4 rubber gloves and rubber sleeves or Class "0" rubber gloves are required: cradle-to-cradle and lock-to-lock.

5. In addition to the above requirements for working on energized conductors and apparatus, Class 2 or 4 rubber gloves and rubber sleeves or Class "0" rubber gloves shall be worn when:
 - a) Operating manually controlled air break switches.
 - b) Making tests for determining if conductors are de-energized.
 - c) Pulling in wire or handling other conducting materials near conductors, apparatus or equipment which is or may become energized at voltages at or above 50 volts.
 - d) Working on or near series street lighting circuits that have not been effectively grounded.
 - e) Racking metal clad circuit breakers to either the "in" or "out" position.
 - f) Required by the person in charge or supervision.
 - g) At the discretion of the employee performing the work.
6. Rubber gloves shall be given an air test and carefully inspected each time they are used.
7. Rubber gloves and rubber sleeves, when not in use, shall be kept in canvas bags or other approved containers and stored where they will not become damaged from sharp objects or exposed to direct sunlight. They shall never be folded while stored, nor shall other objects be placed upon them.
8. Rubber sleeves shall be inspected visually before each use.
9. Rubber gloves shall never be used without leather protectors.
10. Leather protectors shall not be used for any other purpose.

Rubber Line Hose, Insulator Hoods, Blankets, etc.

1. Before work begins on or near energized conductors or apparatus, all energized or grounded conductors and surfaces with which an employee can reasonably come in contact (except that portion of the conductor on which work is to be performed) shall be worked in accordance with "Protection from Electric Shock" above.
2. When installing protective devices, the conductor or apparatus nearest the employee shall be covered first, then the next nearest, and so on, until the working area is fully protected. When the work is completed, the protective devices shall be removed in the reverse order.
3. Line hose, hoods, blankets, etc. shall be visually inspected before each use.
4. Protective devices shall be stored on trucks and elsewhere where they shall not be subjected to damage from tools, other equipment or the elements.
5. Conductors that are subjected to induced voltage and with which an employee can reasonably come in contact shall be adequately covered with protective devices or grounded.

Live Line Tools

1. Employees shall verify that the test dates have not expired on live line tools, before use.
 2. Only tools approved by the Company shall be used in live line work.
 3. For minimum hot stick distance, see Table 1.
 4. All live line tools, when not in use, shall be protected from abrasion or other damage.
 5. Live line tools shall never be laid directly on the ground or against sharp objects.
-

6. Live line tools shall be kept clean and visually inspected before use each day.
7. Live line tools and measuring poles shall be tested annually, whenever repaired and whenever in doubt of the tool's condition.

Power Hand Tools

All portable electric hand tools shall:

1. Be equipped with three-wire cord, having the ground wire permanently connected to the tool frame and means for grounding the other end; or
2. Be of the double insulated type and permanently labeled as "Double Insulated"; or
3. Be connected to the power supply by means of an isolating transformer, or other isolated power supply.

All hydraulic tools, which are used on or around energized conductor(s) or apparatus, shall use non conducting oil and hoses. Hoses shall have adequate strength for the normal operating pressures

The manufacturer's safe operating pressure shall not be exceeded.

All pneumatic tools which are used on or around energized conductor(s) or apparatus shall:

1. Have non conducting hoses having adequate strength for the normal operating pressures, and
2. Have an accumulator on the compressor to collect moisture.

Pole Climbing Equipment

Body Belts and Fall Protection Systems (FPS)

1. Linemen's body belts shall be of approved design and type.
2. Only company issued FPSs shall be used.
3. Metal hooks, chains, etc. for holding tools or tape shall not be attached to body belts. Leather or non-conducting material shall be used for this purpose.
4. Ditty bags shall not be attached closer than four (4) inches to the "D" ring.
5. When an FPS is in use, both snap hooks shall not be attached to the same "D" ring.
6. Before any employee begins any work aloft, their FPS shall be fastened securely around the supporting structure and attached to their body belt.
7. Employees shall not safety off to pole steps, cross arm braces, insulator pins, conductors, rotten or otherwise weak cross arms and attachments which are being moved.
8. Body belts and FPSs shall be inspected prior to each day's use.
9. Defective or altered equipment shall not be used.

Climbers and Climbing Practices

1. Climber gaffs shall be kept sharp at all times. Gaffs measuring less than 1 ¼ inch in length on the underside, shall be replaced.
2. A visual inspection shall be completed prior to climbing a wood pole or performing work that would put added stresses on the pole. The visual inspection should take an overall

look at the pole and cross arm to assess its general condition and to look for any obvious defects. Obvious defects may include but are not limited to, shell rot, surface decay, insect damage, holes, large checks, horizontal cracks, excessive knots, twist in pole, burn marks, mechanical damage, soil conditions (soft, wet or loose), and ground line conditions of the pole.

3. When two employees are to work on the same pole at the same time, one shall reach the working position before the other employee leaves the ground. They shall descend the pole in the same manner.
4. Prior to climbing structures that may have damaged porcelain hardware such as cutouts, lightning arrestors, switches, insulators, transformer bushings, etc. where energized components can unexpectedly fail, a visual inspection of all porcelain hardware shall be conducted. If energized porcelain components are seen to be cracked and/or broken, the overriding priority is to make the situation safe before ascending.

Mechanical Equipment

General

1. Visual inspections shall be made of the equipment to determine that it is in good condition each day prior to use.
2. Tests shall be made prior to use, to determine that all systems are in proper working condition.
3. No employee shall use off road equipment having an obstructed view to the rear unless:
 - a) The vehicle has a reverse signal alarm audible above the surrounding noise level
 - or:
 - b) The vehicle is backed up only when a spotter signals that it is safe to do so.

Aerial Lifts and Derricks

Only trained personnel who have been designated by their supervisor are authorized to operate aerial lifts.

Inspection and Testing

1. Annual inspection shall be performed according to the ANSI Standard A92.2. This inspection shall be documented.
2. At the beginning of each work period, aerial platform equipment shall be visually inspected and operated. At a minimum, from the lower controls: raise and lower the boom, telescope out and in, and swing boom right and left.
3. If the boom or platform has been subjected to shock loading, it shall be given a complete inspection before use. Load limits specified by the manufacturer shall not be exceeded.
4. The insulated section of the boom shall be kept clean at all times.

Travel Procedures

1. The overhead clearance required for the vehicle and trailers being pulled shall be posted in the cab. Be aware of the height of equipment being hauled on the trailer.

2. The truck shall not be moved unless the boom is lowered and cradled, and outriggers fully retracted.
3. Riding in the bucket while the truck is traveling between locations shall not be permitted.

Setting Up at Job Site

1. Assure stability of the equipment prior to boom operations.
2. Before using the boom: the brakes shall be set, the wheels chocked, outrigger pads in place, and all outriggers if equipped, shall be lowered.
3. The operator shall visually observe the lowering of the outriggers or appoint a person on the crew to give directions and ensure that no one is in harm while it is being lowered.

Operation at the Job Site

1. Employees shall not stand or sit on top or edge of the aerial platform.
2. Employees shall comply with Safety Manual section "Protection from Electric Shock" while working from an aerial platform.
3. Employees shall not belt to an adjacent pole or structure while working from an aerial platform. An approved full body harness shall be worn with an approved lanyard attached to the boom when working from an aerial platform.
4. Equipment or material shall not be passed between a pole or structure and an aerial platform while an employee working from the aerial platform is within reaching distance of energized conductors or apparatus not covered with insulating protective equipment.
5. When working near energized conductors or apparatus, aerial equipment shall be grounded or barricaded. The following are acceptable methods for grounding or barricading aerial equipment:
 - Connect one end of the grounding cable to the equipment grounding lug.
 - If available, the grounding cable shall be connected to the system neutral, or
 - The grounding cable shall be connected to the pole ground that has been verified as connected to either the system neutral or the grounded overhead shield wire, or
 - Barricade off the equipment to prevent contact with the equipment.
 - A screw-in ground may be used if none of the three options above are available.
(Note: before using the screw-in ground, underground locates shall be made).

The barricading system shall be inspected before each use.

When deployed, the barricading system shall prevent anyone on the ground from contacting the equipment.

All equipment grounding cables shall be at least 2/0 copper.

All wire/cable shall be brushed clean before installing the ground clamps.

Equipment grounding cables that are too short, may be daisy chained for added length, as long as they are connected together using 4/0 copper or greater ampacity.

6. The operator of a derrick line truck shall not leave the position at the controls while a load is suspended, unless the employer can demonstrate that no employee (including the operator) is endangered.

Cranes and other lifting equipment

With the exception of equipment certified for work on the proper voltage, mechanical equipment shall not be operated closer to any energized line or equipment than the minimum approach distance (Table 1) unless:

1. An insulated barrier is installed between the energized part and the mechanical equipment, or
2. The mechanical equipment is insulated.

Material Handling

Unloading

Prior to unloading steel, poles, cross arms and similar material, the load shall be thoroughly examined to ascertain if the load has shifted, binders or stakes have broken or the load is otherwise hazardous to employees.

Pole Hauling

1. During pole hauling operations, all loads shall be secured to prevent displacement, and a red flag shall be displayed at the trailing end of the longest pole.
2. Precautions shall be exercised to prevent blocking of roadways or endangering other traffic.
3. Poles left on or near a street, highway or roadway shall be protected by a warning device and blocked to prevent rolling.
4. When hauling poles during the hours of darkness, or when required by owner, illuminated warning devices shall be attached to the trailing end of the longest pole.

Storage

1. No materials or equipment shall be stored under energized bus, energized conductors, or near energized equipment, if it is practical to store them elsewhere.
2. When materials or equipment are stored under energized conductors or near energized equipment, applicable clearances shall be maintained as stated in Table 1; and extraordinary caution shall be exercised when moving materials near such energized equipment.

Tag line

Tag lines or other suitable devices shall be used to control loads being handled by hoisting equipment, unless it would cause an additional hazard. The load would then have to be positively secured.

Framing

During framing operations, employees shall not work under a pole or a structure suspended by a crane, A-frame or similar equipment unless the pole or structure is adequately supported.

Attaching the load

1. The hoist rope shall not be wrapped around the load.
2. An insulated device shall be inserted in the winch line when using the winch line to handle conductors energized at 600 volts or above.

Grounding for Protection of Employees

General All conductors and apparatus shall be treated as energized until tested and grounded.

Conductors and apparatus may be considered de-energized and worked as such if the hazard of induced voltages is not present, and adequate clearances or other means are implemented to prevent contact with energized conductors or apparatus.

Communication conductors Wire communication conductors on power poles or structures shall be treated as a ground potential.

Voltage testing De-energized conductors and apparatus, which are to be grounded, shall be tested for voltage prior to grounding.

Attaching grounds

1. When attaching grounds, the ground end shall be attached first, and the other end shall be attached by means of an insulated tool.
2. When removing grounds, the grounding device shall first be removed from the conductor or apparatus using an insulating tool. The connection to the ground shall be removed last.

Grounds shall be placed between work location and all sources of energy and as close as practicable to the work location. When grounding is impracticable, or the conditions resulting therefore would be more hazardous than working on the conductors or equipment without grounding, the grounds may be omitted and the conductor or equipment worked as energized.

Note: Owner's more stringent grounding policies shall be adhered to.

Testing without grounds. Grounds may be temporarily removed only when necessary for test purposes, and extreme caution shall be exercised during the test procedures.

Grounding electrode. When grounding electrodes are utilized, such electrodes shall have a resistance to ground low enough to remove the danger of harm to personnel or permit prompt operation of protective devices.

Grounding to tower. Grounding to tower shall be made with a tower clamp capable of conducting the anticipated fault current.

Ground lead. A ground lead, to be attached to either a tower ground or driven ground, shall be capable of conducting the anticipated fault current and shall have a minimum conductance of No. 2 AWG copper.

Daisy chaining personal grounding cables is acceptable when connected together using 4/0 copper or greater ampacity.

Overhead Construction

Overhead Practices

1. Before installing or removing wire or cable, strains to which poles and structures will be subjected shall be considered, and necessary action taken to prevent failure of supporting structures.
2. Pole holes shall not be left unattended or unguarded.
3. Tag lines shall be of a non-conductive type when used near energized conductors and/or apparatus.

4. Adequate traffic control shall be maintained when crossing highways and railways with equipment.
5. A Qualified Observer shall be utilized to determine that required clearance is maintained in moving equipment under or near energized lines.

Metal tower construction

1. Excavations for pad- or pile-type footings in excess of 5 feet deep shall be either sloped to the angle of repose, or shored if entry is required. Ladders shall be provided for access to pad- or pile-type footing excavations in excess of 4 feet.
2. Provisions shall be made for cleaning out auger-type footings without requiring an employee to enter the footing unless shoring is used to protect the employee.
3. A designated employee shall be used in directing mobile equipment adjacent to footing excavations.
 - a) No one shall be permitted to remain near the footing while equipment is being spotted for placement.
 - b) Where necessary to assure the stability of mobile equipment, the location of use for such equipment shall be graded and leveled.
4. Tower assembly shall be carried out with a minimum exposure of employees to falling objects when working at two or more levels on a tower.
 - a) Guy lines shall be used as necessary to maintain sections or parts of sections in position and to reduce the possibility of tipping.
 - b) Members and sections being assembled shall be adequately supported.
5. When assembling and erecting towers, the following shall be complied with:
 - a) The construction of transmission towers and the erecting of poles, hoisting machinery, site preparation machinery, and other types of construction machinery shall conform to the applicable requirements of this part.
 - b) No one shall be permitted under a tower which is in the process of erection or assembly, except as may be required to guide and secure the section being set.
 - c) When erecting towers using hoisting equipment adjacent to energized conductors, the conductors shall be de-energized when practical. If the conductors are not de-energized, the minimum approach distances shall be observed in Table 1.
 - d) Erection cranes shall be set firm and level. When the cranes are so equipped, all outriggers and pads shall be used.
 - e) Tag lines shall be utilized to maintain control of tower sections being raised and positioned.
 - f) The load line shall not be detached from a tower section until the section is adequately secured.
 - g) Erection shall be discontinued in the event of high wind or other adverse weather conditions which would make the work hazardous.
 - h) Equipment and rigging shall be regularly inspected and maintained in safe operating condition.

Stringing or removing conductors

1. Stringing equipment shall be grounded or barricaded.

2. Prior to stringing operations, a job briefing shall be held with all employees gathered at one location.
3. A "Wire Pull Safety Check List" shall be completed before stringing operations begin. (see form).
4. Where there is a possibility of the conductor accidentally contacting an energized conductor or receiving an induced voltage build up the conductor during installation or during removal shall be grounded.
5. If the existing conductor is de-energized, proper clearance authorization shall be secured and the conductor grounded on both sides of the crossover or, the line being strung or removed shall be worked as energized.
When crossing over energized conductors in excess of 600 volts, guard structures shall be installed unless provision is made to isolate or insulate the employee or the energized conductor. Where practical, the automatic reclosing feature of the circuit interrupting device shall be made inoperative. In addition, the conductor being strung shall be grounded.
6. Conductors being strung in or removed shall be kept under positive control by the use of proper tension to prevent accidental contact with energized conductors.
7. Guard structure members shall be sound and of adequate dimension and strength, and adequately supported.
 - a) Catch-off anchors, rigging, and hoists shall be of ample capacity to prevent loss of the conductors.
 - b) The manufacturer's load rating shall not be exceeded for conductors, stringing equipment, sock connections, and all load-bearing hardware and accessories.
 - c) Pulling lines and accessories shall be inspected regularly, and replaced or repaired when damaged or when dependability is doubtful
8. Conductor grips shall not be used on wire rope unless designed for this application.
9. While the conductor or pulling line is being pulled (in motion), employees shall not be permitted directly under overhead operations, nor shall any employee be permitted to be on the structure.
10. Clipping and tying crews shall work between grounds at all times. The grounds shall remain intact until the conductors are clipped in, except on dead end structures.
11. Stringing and clipping operations shall be discontinued when adverse weather (such as high wind or ice on structures) makes the work hazardous.
 - a) Stringing and clipping operations shall be discontinued during an electrical storm in the immediate vicinity.
 - b) Reel handling equipment, including pulling and tensioning equipment, shall have ample capacity, operate smoothly, and be leveled and aligned in accordance with the manufacturer's operating instructions.
 - c) Reliable communications between the tensioner and puller operator shall be provided.
 - d) Each pull shall be caught off or dead-ended at both ends before subsequent pulls.

12. When stringing adjacent to energized lines, the tension stringing method shall be used.
13. During stringing operations, each bare conductor, sub-conductor, and overhead ground conductor shall be grounded at the first transmission tower adjacent to both the tensioning and pulling setup and in increments so that no point is more than 2 miles from a ground.
 - a) The grounds shall be left in place until conductor installation is completed.
 - b) Except for rolling grounds, the grounds shall be placed and removed with a live line tool.
14. Conductors, sub-conductors, and overhead ground conductors shall be grounded at all dead-end or catch-off points or considered energized.
15. A ground shall be located at each side and within 10 feet of working areas where conductors, sub-conductors, or overhead ground conductors are being spliced at ground level. The two ends to be spliced shall be bonded to each other. It is recommended that splicing be carried out on either an insulated platform or on a conductive metallic grounding mat bonded to both grounds. When a grounding mat is used, it is recommended that the grounding mat be roped off and an insulated walkway provided for access to the mat.
 - a) All conductors, sub-conductors, and overhead ground conductors shall be bonded to the tower at any isolated tower where it may be necessary to complete work on the transmission line.
 - b) Work on dead-end towers shall require grounding on all de-energized lines.
 - c) Grounds may be removed as soon as the work is completed: Provided, that the line is not left open circuited at the isolated tower at which work is being completed.
16. When performing work from the structures, clipping crews and all others working on conductors, sub-conductors, or overhead ground conductors shall be protected by individual grounds installed at every work location.

Wire Pull Safety Check List

Location: _____

Date: _____ Weather: _____

1. Have all energized crossing been adequately covered? YES NO

Comments: _____

2. Is the take-off dolly the appropriate size? YES NO

Comments: _____

3. Have all necessary clearances and hot permits been obtained? YES NO

Comments: _____

4. Has the system been put on "one shot"? YES NO

Comments: _____

5. Has the stringing equipment been grounded? YES NO

Comments: _____

6. Is the stringing equipment properly secured? YES NO

Comments: _____

7. Has the underbuild/parallel energized line within minimum approach distance been properly spread or covered? YES NO

Comments: _____

8. Has a proper job briefing been filled out? YES NO

Comments: _____

9. Have the socks been banded? YES NO

Comments: _____

10. Has a third party "drove the pull" looking for any unforeseen hazards? YES NO

Comments: _____

Signature	Print Name
Foreman: _____	_____
Crew Member: _____	_____
Crew Member: _____	_____
Crew Member: _____	_____
Crew Member: _____	_____

Construction in Energized Substations

Work near energized equipment facilities

1. Upon entering an attended substation, each employee, other than employees regularly working in the station, shall report his or her presence to the employee in charge of substation activities to receive information on special system conditions affecting employee safety.
2. When construction work is performed in an energized substation, authorization shall be obtained before work is started.
3. When work is to be performed in an energized substation, the JF Electric, Inc. Safety Manual section "Protection from Electric Shock" shall be followed.
4. Caution shall be exercised and proper PPE used in the handling of busbars, tower steel, materials, and equipment in the vicinity of energized conductors and/or apparatus.

De-energized equipment or conductors

When work is to be performed on a de-energized section of a substation, the JF Electric, Inc. Safety Manual section "Protection from Electric Shock" shall be followed.

Barricades and barriers

1. Barricades or barriers shall be installed to prevent accidental contact with energized conductors and apparatus, while adhering to the appropriate minimum approach distances.
2. Where appropriate, signs indicating the hazard shall be posted near the barricade or barrier.

Control panels

1. Work on or adjacent to energized control panels shall be performed by qualified and authorized employee(s).
2. Precaution shall be taken to prevent accidental operation of relays or other protective devices due to jarring, vibration, or improper wiring.

Mechanized equipment

1. Use of vehicles, cranes, and other equipment around energized substation conductors and/or apparatus shall at all times be controlled by qualified and authorized employees.
2. All mobile cranes and derricks shall be effectively grounded to the grounding grid and/or barricaded when operated within minimum approach distance to energized conductors and apparatus.

Substation fences

1. When a substation fence must be expanded or removed for construction purposes, a temporary fence affording similar protection, when the site is unattended, shall be provided. Adequate bonding shall be maintained between temporary fence and permanent fence.
2. All gates to unattended substations shall be locked, except when work is in progress.

Footing excavation

1. Excavation for auger, pad and piling type footings for structures and towers shall require the same precautions as for metal tower construction.

2. No employee shall be permitted to enter an unsupported auger-type excavation in unstable soil for any purpose. Necessary clean-out in such cases shall be accomplished without entry.

Substation & Relay

General

- For job briefing requirements, refer to Utility Line Department Daily Job Briefings.
- Only qualified personnel shall enter a substation. Non-qualified personnel shall be escorted by a qualified employee
- Upon entering a substation where other employees are present, report your presence to the crew leader/employee in charge in order to exchange information on special system conditions affecting employee safety.
- When working in an energized substation that is accessible by the public, gates shall be kept closed.
- Damage to fences or missing signs shall be reported immediately to the supervisor.
- Materials or equipment shall not be stored under energized busses, lines, or near energized equipment. When materials must be stored in an energized substation, they shall not be closer than:
 - a. 50 KV or less – 10 feet
 - b. >50 KV – 10 feet plus 4 inches for every 10 kV over 50 kV
- When leaving a substation employees shall close all doors, lock all outside gates, and check to be sure everything is secure and in proper order. Consideration shall be given to eliminating conditions which might attract unauthorized entry.

Aerial Basket Auxiliary Power Pack

- Unless the aerial basket is equipped with an "Auxiliary Power Pack" (for remote starting and stopping of the engine and emergency operation of the boom and basket with the truck engine dead), a second employee shall be present to operate the emergency controls. A hand line which may be used as a safety escape devise shall be standard equipment on all aerial baskets.

Barriers

- Barriers or flagging devices shall be employed to distinctly outline working area limits to prevent employees from coming within reach of conductors energized above 600 volts, moving machinery, open excavations and other hazards.
- The flagging devices employed will vary, depending on the location and the type of equipment being worked on. These devices or markers shall be left in place until work is completed.
- Protective guards, such as properly rated insulated barriers or protective rubber cover, shall be used to isolate the employee against energized electrical circuits and equipment that is within the minimum approach distance (Refer to Minimum Approach Distance table in the Utility Line Department Section) during the performance of work. These

protective guards shall be so constructed as to afford complete protection for the employee.

- Whenever busses, conductors or equipment are to be de-energized and cleared for work, the Utility's clearance procedure shall be followed.

Work on Energized Lines

- Depending on the voltage, working on energized conductors and apparatus in a substation shall be performed with Class "0" rubber gloves, Class 2 or 4 rubber gloves with rubber sleeves, or with live line tools.
- Employees on the ground shall observe work being done and promptly warn those doing the work of any hazards.
- An employee shall not change position on a ladder or structure without first making certain that their new position will place them in the clear and not before informing fellow employees as to what they intend to do. Work shall stop until they have reached the new position and belted in.

Care and Inspection of Live Line Tools

- Live line tools shall be examined before and after each usage for cracks, rough or scarred places and metallic parts securely fastened.
- Live line tools shall never be laid out on the ground.
- In order to keep live line tools in good condition, they shall be cared for in accordance with Utility Line Department instruction for Live Line Tools.

Rubber Glove Use and Inspection

- Where rubber gloves are required, the employee shall make a visual and feel test of leather protectors and a visual and air test for rubber gloves.

Grounding

See section on Grounding for Protection of Employees in this manual. The following section contains information supplemental to that section.

- Circuits or electrical equipment shall be considered energized unless properly grounded. If the employee can demonstrate that the installation of a ground is impracticable then the lines and equipment may be treated as de-energized provided all the following conditions are met:
 - a. The line and equipment have been de-energized.
 - b. There is no possibility of contact with another energized source.
 - c. The hazard of induced voltage is not present.
 - d. New equipment that has never been energized.
- Any ungrounded fences or broken or missing grounds shall be reported immediately to supervision.
- Grounds used for busses, conductors or equipment within a substation shall be a minimum of 2/0 copper. Grounds used for busses, conductors or equipment within a

substation 34kV or higher shall be parallel 2/0 copper or 4/0 copper in areas where higher fault current levels are identified.

- When practicable, ground to ground grid.
- Where practicable, testing equipment shall be grounded prior to its use. If testing equipment is set up in the back of a vehicle for the purpose of making a test, the equipment shall be bonded to the vehicle and the vehicle grounded to the substation ground system.
- Ground using a single connection to ground (single point grounding), as close to the work being performed as practical. Daisy chain grounding to each phase from a common ground, is acceptable. Note: owner's more stringent grounding policies shall be adhered to.
- Prior to working on busses, conductors or equipment normally energized above 600 volts where the work requires the conductors to be de-energized:
 - a. The section of buss equipment or line involved shall be identified.
 - b. The proper clearance shall be obtained from the utility company.
 - c. It shall be isolated from all sources of voltage.
 - d. A test for voltage shall be conducted to ensure that busses, conductors or equipment have been de-energized.
- Protective grounds shall be inspected prior to each use, particularly the condition of the cables at the point of connection to the clamps.
- Contact points where grounds are to be placed shall be cleaned and connections shall be tight.
- For truck or equipment grounding see Aerial Lifts and Derricks Operation at the Job Site.

Testing Performed on Grounded Systems

- Grounds may be temporarily removed from equipment for testing. Obtain proper clearance before applying test voltage or current. Grounds shall be replaced immediately following testing.
- Live line tools and all other applicable personal protective equipment shall be used when installing, replacing or removing ground cables.
- No person shall contact energized equipment during the test procedure. All employees shall adhere to the Minimum Approach Distances Table.

Use of the Relay Test Sets

- The power supply for the test sets shall be of proper voltage range and frequency. The power source shall be properly protected against short circuits by fusing or other accepted means.
- Draw-out type relays shall be calibrated outside of their switchboard mounted relay cases. When testing non-drawout type relays or drawout type relays in their cases, application of test current and/or potential to the relay, shall not be applied unless the relay has been cleared from its normal sources of operating current and/or potential, and tripping potential has been removed.

- When using test plugs or jacks, links shall be secure and in their proper locations before inserting the plug or jack in the test device to prevent backfeed.

Load Checking

- Caution shall be exercised when load checking relay and meter circuits. At no time shall any current circuit be open circuited as a result of performing these checks.

High Potential Testing

- The portable test set is equipped with a Remote Safety Interlock Switch. The person responsible for the operation of the safety switch shall be positioned in such manner as to have full view of the test area, adhere to minimum clearance distances as specified in the "Minimum Approach Distance" table, and shall be responsible for discontinuing the test by releasing the Safety Interlock Switch to be bypassed.

Power Factor Insulation Testing

- The Doble Power Factor test sets are equipped with two safety switches; one for use by the test set operator and the other for use by the person handling the test cable. Under no condition shall the test set be operated with either safety switch bypassed.
- Since the safety switches are subject to failure, their operation shall be tried before starting a series of tests. The hook shall be considered energized until properly tested to assure that it is de-energized. Upon completion of each test, the hook shall be checked for de-energization by touching to ground.
- The person handling the test cable shall safeguard himself and others from coming in contact with the apparatus energized by the test set.
- Appropriate Class 2 or 4 rubber gloves with rubber sleeves shall be worn when making or breaking a test connection or holding the test cable while test voltage is being applied.
- Test cables may be attached to a live line tool or other insulated protective devices as long as the Minimum Approach Distances are not violated.
- Before energizing the test set, the operator shall have all employees in the clear and the metallic ground conductor securely connected from the test case to a station ground grid riser or other adequate ground.
- When making investigative tests on suspected faulty transformers, the combustible gas content of the nitrogen blanket shall be checked before applying test voltages. Under no circumstances are test voltages to be applied when the combustible gas content is greater than 2% TCG (Total Combustible Gas).

Potential Transformers

- Primary and secondary fuses shall be removed when potential transformers, or other equipment to which their primary windings are connected, are to be worked on.
- Secondary readings on transformers greater than 34.5kV shall be performed remotely from the transformer. Take readings in control building if possible.

- Caution shall be exercised regarding the high voltage windings of potential transformers or metering devices which may be energized from the low voltage side.

Current Transformers

- The secondary windings for current transformers shall never be open circuited when the primary circuit is energized or carrying load, due to the high voltages that can develop across open windings. The full secondary windings on any unused current transformers shall be securely short circuited with a lugged jumper.
- Because of the hazards involved, current circuits shall be de-energized before work is to be performed.
- When it is necessary to short out a current circuit, place a secure jumper across the current transformer side at the points of removal. All such jumpers to be used for temporary current transformer secondary connections shall be pre-tested for continuity.
- Proper grounding shall be maintained on current transformer secondary circuits.

Coupling Capacitor Potential Devices

- When it is necessary to apply a test potential to the high voltage side of a coupling capacitor potential device, the high voltage conductor to the capacitor unit shall be de-energized and properly isolated from its energy source, under the proper utility company clearance before contacting any high voltage part of the coupling capacitor. Follow the safety rules for high potential testing in this section.
- Before making any adjustments to the secondary voltage of the potential device, the coupling capacitor ground switch shall be closed by use of a live line tool or Class 2 or 4 rated rubber gloves and rubber sleeves.

Capacitors

- Work shall not be done on a capacitor until it has been disconnected from the line and discharged. A capacitor, its switches and lead shall be considered energized, even after the fuses have been opened, until it has been discharged by short-circuiting and grounded with an approved live line tool. Employees shall wait for at least five minutes after opening the switches before short-circuiting the capacitor.
- Be sure all terminals are shorted to each other and left shorted (except while testing) before work is started and until work has been completed, as well as while in storage or transport.
- Capacitors in the low voltage range of 120/240 volts shall also be worked on using a high degree of precautionary measures. These capacitors have the same operating characteristics as the high voltage capacitors insofar as retaining their electrical charge. However, because of the lower voltage being handled, the secondary capacitors can safely be shorted out after waiting three minutes.
- Care shall be taken to avoid backfeed from secondary capacitors. Never open the secondary of an energized transformer on which capacitors are connected without first

opening the primary side of the transformer and allowing time for the secondary capacitor to discharge.

- Capacitor banks with normally energized frames supporting multiple-series capacitor cells shall be temporarily grounded for employee protection both at the line and at the frame.

Circuit Breakers

- All high voltage conductors to the breaker shall be de-energized and properly isolated under the Utility Company's Clearance Procedure. Grounds shall be properly installed on both the buss and line sides of the breaker before contacting any high voltage part of the breaker. Grounds may be temporarily removed for test purposes.
- When work is to be done on the operating mechanism of a circuit breaker, the breaker shall be in the open position (neutral position for spring operated breakers), all control circuits shall be de-energized, and the proper lockout tagout procedures shall be used. On pneumatically or hydraulically operated breakers, the main valve controlling the operating forces shall be fully closed.
- When a circuit breaker is to be operated for test or other reasons, all personnel in the nearby area shall be warned and shall be out of danger before the operation is performed. This is to insure they are not in a location where the operation of a circuit breaker could startle them, causing an injury.
- Tanks shall be considered energized unless connected to the substation ground grid.
- No circuit or equipment where power connections have been cut, separated or changed shall be put in service until a test for correct phase rotation and phase connection has been made.
- The closing mechanism shall not be worked on when a circuit breaker is being operated.
- Any device operated by stored energy (such as hydraulic, pneumatic or spring-operated circuit breakers) shall have the stored energy drained, blocked or otherwise restrained to prevent injury from the unexpected movement when needed during maintenance activities per proper lockout-tagout procedures.

Circuit Breaker Performance Analyzers

- The analyzer control panel should be placed at ground level. Under no circumstances shall the mechanism be operated from atop the breaker. DC control circuits for the analyzer control panel shall be connected to the load side of the circuit breaker control power isolating switch.
- Before the analyzer control circuits are connected, and while testing operations are in progress, the operator shall have all persons clear of the breaker mechanism and the analyzer.
- The circuit breaker control circuits shall be made inoperable during the time the transducer is being installed or removed.

Air or Gas Blast Breakers

- Caution shall be exercised regarding static voltages which can be present on the breaker due to the configuration of the EHV switchyards. While the magnitudes of these static voltages are not hazardous, they may have a startling effect, if unexpected.
- When work is to be done inside an interrupter module, air or gas pressure shall be reduced to zero before the interrupter door bolts are removed. The interrupters shall not be pressurized nor the breaker operated until all of the door bolts are properly installed.

Reclosers

- All reclosers, except when adequately grounded, shall be considered to be energized until completely disconnected on both the source and load sides. This may be done either with disconnecting switches or by removal of hot line clamps.

Lightning Arresters

- Lightning arresters shall be considered energized even though disconnected from the circuit, until they have been properly discharged and grounded.

High Voltage Bushings

- High voltage bushings shall be discharged before handling after they have been in service due to the possibility of a static charge.

Transformers & Regulators

- Regardless of the equipment being used, there shall be no contact with transformer bushings and their connections while test potential is applied.
- No person shall attempt to stand on top of or make any test on a transformer while a vacuum is being pulled.

Transformer Ratio and Polarity Testing

- Before starting to set up the test equipment, all high voltage conductors to the transformer shall be de-energized and properly isolated under the Utility Company's Clearance Procedure. Before applying a test voltage, all windings shall be clear of ground.
- Normally the ratio and polarity tests on power transformers are made with a Transformer Turns Ratio (TTR) test set. Voltages encountered when testing with this device are nominal; however, there shall be no contact with the high voltage bushings of the transformer while test potential is being applied.
- When the TTR test set is not available, use an alternate test voltage source to make these tests. In these cases, if the test source supply voltage is to be applied to the low voltage winding of the transformer, the maximum resulting voltage to be anticipated at the high voltage terminals shall be calculated and appropriate safeguards and test connections provided for this voltage. The expected voltage can be calculated as the test voltage times the winding ratio. The test equipment and the equipment being

tested shall be adequately guarded to prevent anyone from coming into contact with the high voltage terminals or conductors while the test voltage is applied.

Transformer Winding Resistance Testing

- The winding being tested shall be shorted with a test jumper immediately after the test voltage is removed. This jumper shall remain in place until the test leads, have been removed from the winding terminals. Class 2 or 4 rubber gloves and rubber sleeves shall be worn while the jumper is being installed and the test leads removed.

Oil Filling, Transferring

- The oil-filtering trailer shall be grounded and the hoses bonded during filtering operation.
- When transferring oil from one metal container to another, the containers shall be bonded.
- Prior to pumping oil into metal or plastic containers such as drums, buckets, storage tanks, etc., from any piece of equipment, especially a filed piece or one with high combustible gases, the container shall be grounded to avoid static buildup. If pumping in or out of a plastic container, make sure the metal wand or the bonded hose extends all the way to the bottom of the container.

Regulators

- Control circuit supply switches shall be opened and motor supply fuses pulled before doing maintenance work on the controls of a regulator while in service.
- Appropriate protection from cables or bushings shall be provided when maintenance work is being done on an energized regulator. Refer to the Minimum Approach Distance Table and Rubber Gloves and Rubber Sleeves Section.
- When placing voltage regulators in service or removing them from service using bypass switches, the regulator shall be in the neutral position and turned off.
- Two indications of neutral position shall be utilized prior to bypassing a step voltage regulator.

Regulators and Transformers with Load Tap Changing Equipment

- When operating the mechanism of step-type regulators or transformer load tap changers from an outside source of power, it is absolutely essential that the necessary steps be taken to prevent backfeed through the self-contained power or potential transformers.
- The control circuit supply switches shall be opened when cleaning induction regulator or transformer LTC mechanisms, or when adjustments are to be made to the voltage regulating relays and auxiliary controls.
- Attention shall be concentrated at the point where the test jumper is being applied. In self-contained regulators, identify the circuit to ensure that jumpers and test connections will not be made in error when applying control power. Caution shall be used to avoid energizing the regulator primary potential transformer. Temporary connections shall be secure to avoid being pulled loose.

Underground Construction

A manhole or vault that contains electric cable and/or electric equipment is considered a confined space until it is determined that there is no hazardous atmosphere or other hazards present.

All of the steps of a "Confined Space" shall be followed before the manhole or vault can be classified as an "Enclosed Space". This would include documentation on the "Confined/Enclosed Space Entry Permit" (see "Confined Spaces" section in Safety Manual).

Once it is determined there is no hazardous atmosphere or other hazards present, the manhole or vault can be classified as an "Enclosed Space". While work is being performed in the enclosed space, an attendant with first-aid training shall be immediately available outside the enclosed space to provide assistance if a hazard exists because of traffic patterns in the area of the opening used for entry. The attendant is not precluded from performing other duties outside the enclosed space if these duties do not distract the attendant from monitoring employees within the space or ensuring that it is safe for employees to enter and exit the space.

Guarding and ventilating street opening used for access to underground cables and/or apparatus.

1. Appropriate warning signs shall be promptly placed when covers of manholes, hand holes, or vaults are removed. The covers shall be moved out of the working area to avoid a tripping hazard. They shall be removed and replaced by means of approved hooks or devices.
2. Before an employee enters a street opening, such as a manhole, or an unvented vault, it shall be promptly protected with a barrier, temporary cover, or other suitable guard.
3. No entry shall be permitted in a manhole or vault until the atmosphere is determined safe by testing for oxygen deficiency and the presence of explosive gases or vapors.
4. A ladder shall be used when entering or leaving a manhole or vault. No one shall climb into or out of manholes or vaults by stepping on cables or hangers.

Hazardous Atmospheres and Enclosed Spaces.

Employees shall not be permitted to work in hazardous and/or toxic atmospheres. Such atmospheres include those with:

- Less than 19.5% or more than 23.5% oxygen;
- A combustible gas concentration greater than 20% of the lower flammable limit; and
- 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).

Testing for atmospheric contaminants shall be conducted and continuous forced air ventilation used before entering the enclosed space and continued until everyone exits the enclosed space.

Emergency Rescue Equipment.

Emergency rescue equipment shall be available at all enclosed spaces. Requirements are as follows:

1. Employees entering a vault/manhole type enclosed space, shall don a harness.

2. Lifeline(s) shall be available at the opening of the enclosed space at all times.
3. Employees who enter enclosed spaces and attendants shall be trained.

Work in manholes.

1. Upon first entering a manhole or vault, make a careful inspection for unsafe conditions, such as cracks or other defects in the roof, walls, floors, ducts and sumps, and for evidence of sheath cracks, leaks and electrical tracking or burning on cables and joints. If any unsafe conditions exist, the employee(s) shall exit the manhole or vault and report the conditions to their supervisor.
2. While work is being performed in manholes, an employee with first aid and CPR training shall be available in the immediate vicinity to render emergency assistance as may be required. This shall not preclude the employee in the immediate vicinity from occasionally entering a manhole to provide assistance, other than emergency. This requirement does not preclude a qualified employee, working alone, from entering for brief periods of time, a manhole where energized cables or equipment are in service, for the purpose of inspection, housekeeping, taking readings, or similar work, if such work can be performed safely.

Trenching and excavating.

1. During excavation or trenching, efforts shall be made to determine the location of all underground facilities.
2. When underground facilities are exposed (electric, gas, water, telephone, etc.) they shall be protected as necessary to avoid damage.
3. When multiple cables exist in an excavation, the cable to be worked on shall be identified by electrical means unless its identity is obvious by reason of distinctive appearance.
4. When working on buried cable or on cable in manholes, metallic sheath continuity shall be maintained by bonding across the opening or by equivalent means.
5. Underground cables and apparatus shall be considered energized until tested and grounded.
6. Because of the characteristics of secondary network systems, when work is performed on cables or apparatus, employees shall take extra precautions by using necessary rubber protective equipment, observing adequate clearances and using proper tools.
7. All energized underground cables shall be handled with appropriate protective equipment.
8. No work shall be performed on underground cable and apparatus without grounding the cable on each side of the work location.

Excavations: Hazard Recognition in Trenching and Shoring

Introduction

This section is intended to assist employees working in excavations in the recognition of trenching and shoring hazards and their prevention.

When excavations are required, the state's one-call notice system shall be contacted.

Excavation for one-call means any operation in which earth, rock or other material in or on the ground is moved, removed, or otherwise displaced by means of any tools, power equipment or explosives; and includes, without limitation, grading, trenching, digging, ditching, drilling, auguring, boring, tunneling, scraping, cable or pipe plowing.

Definitions

Accepted Engineering Practices are procedures compatible with the standards of practice required of a registered professional engineer.

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.

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.

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.

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.

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.

Ingress and Egress means "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.

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.

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" when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

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.

Subsurface Encumbrances include underground utilities, foundations, streams, water tables, transformer vaults, and geological abnormalities.

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

Tabulated Data are tables and charts approved by a registered professional engineer and used to design and construct a protective system.

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.

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.

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.

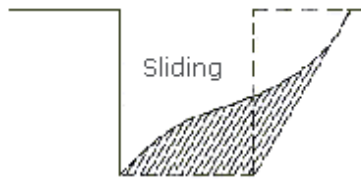
Overview: Soil Mechanics

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.

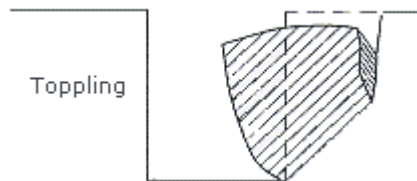
Tension Cracks. Tension cracks usually form at a horizontal distance of 0.5 to 0.75 times the depth of the trench, measured from the top of the vertical face of the trench. See the accompanying drawing for additional details.



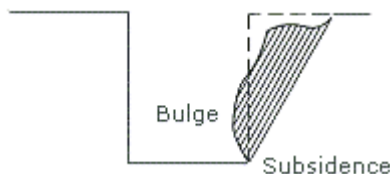
Sliding or sluffing may occur as a result of tension cracks, as illustrated in the drawing.



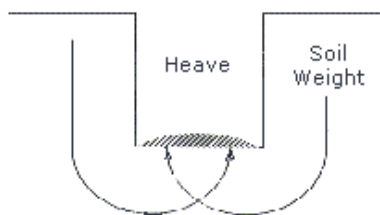
Toppling. In addition to sliding, tension cracks can cause toppling. Toppling occurs when the trench's vertical face shears along the tension crack line and topples into the excavation.



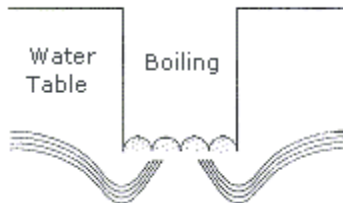
Subsidence and Bulging. An unsupported excavation can create an unbalanced stress in the soil, which, in turn, causes subsidence at the surface and bulging of the vertical face of the trench. If uncorrected, this condition can cause face failure and entrapment of workers in the trench.



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. Heaving and squeezing can occur even when shoring or shielding has been properly installed.



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.



Determination of Soil Type

There are four (4) types of soil and rock categories:

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.

Layered Geological Strata. Where soils are configured in layers, i.e., where a layered geologic structure exists, the soil shall 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.

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 \pm 20-40%.

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).

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.

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.

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.

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 shall 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 shall check for "quick" conditions. In addition, the area adjacent to the excavation shall be checked for signs of foundations or other intrusions into the failure zone, and the evaluator shall check for surcharging and the spoil distance from the edge of the excavation.

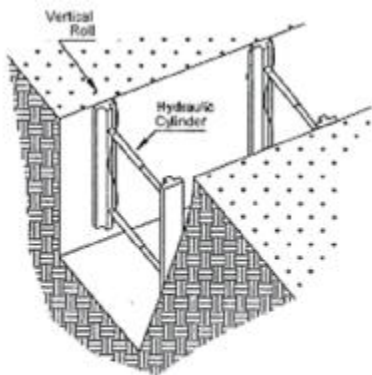
Shoring Types

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. Materials used for shoring shall be in good serviceable condition. Proper shoring requires mechanical design and consideration of the work to be performed. This shall be performed by the competent person or a licensed professional engineer.

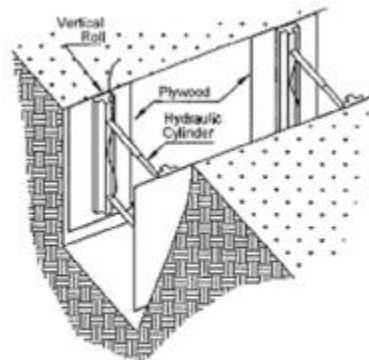
No one shall disturb or alter shoring once it has been installed in the excavation while work is being performed in the trench.

Hydraulic Shoring

All shoring shall be installed from the top down and removed from the bottom up. Hydraulic shoring shall 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.

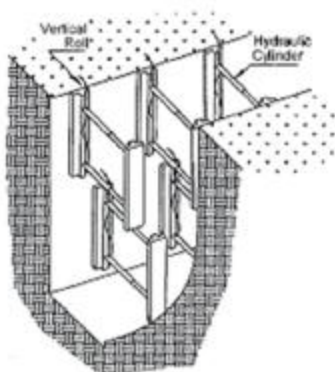


Vertical Aluminum Hydraulic Shoring (Spot Bracing)

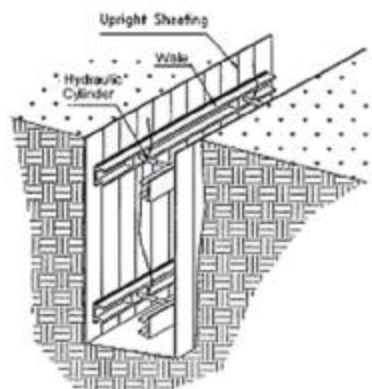


Vertical Aluminum Hydraulic Shoring (With Plywood)

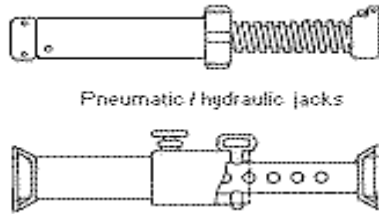
Shoring Variations: Typical Aluminum Hydraulic Shoring Installations.



Vertical Aluminum Hydraulic Shoring (Stacked)



Aluminum Hydraulic Shoring Water System (Typical)



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.

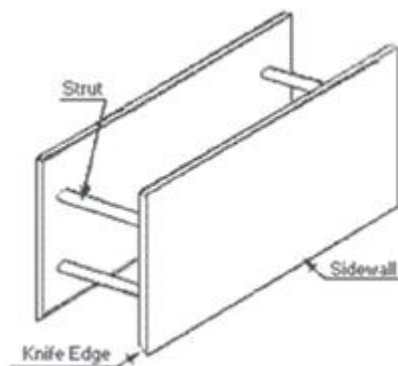
Single-Cylinder Hydraulic Shores. Shores of this type are generally used in a water system and in shallow trenches where face stability is required.

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 shall be conducted only under the direction and with the approval of a registered professional engineer.

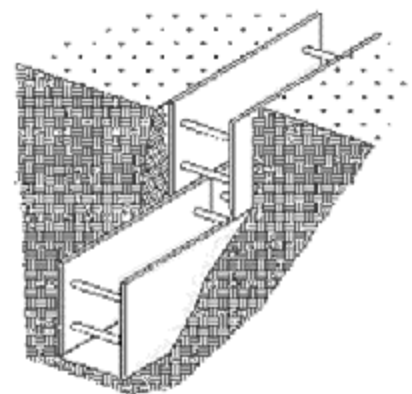
Shielding Types

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 shall 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 shall not be subjected to loads exceeding those which the system was designed to withstand.

Trench Shield (left)



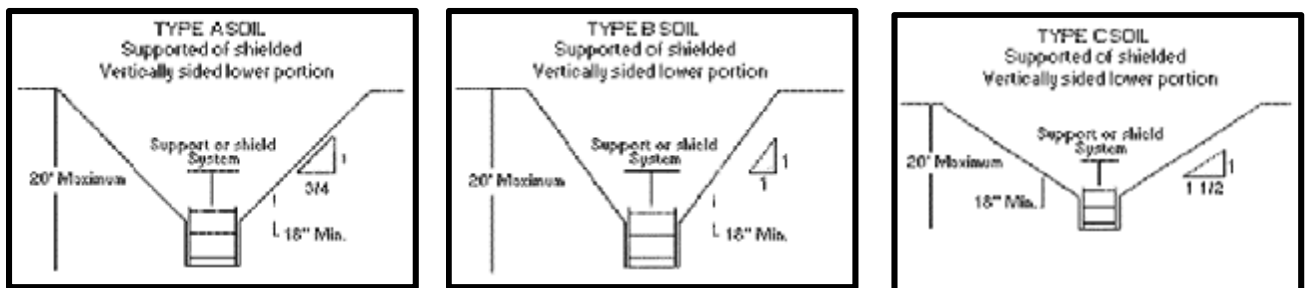
Trench Shield-Stacked (right)



Combined Use. Trench boxes are generally used in open areas, but they also may be used in combination with sloping and benching. The box shall 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.

Slope and Shield Configurations



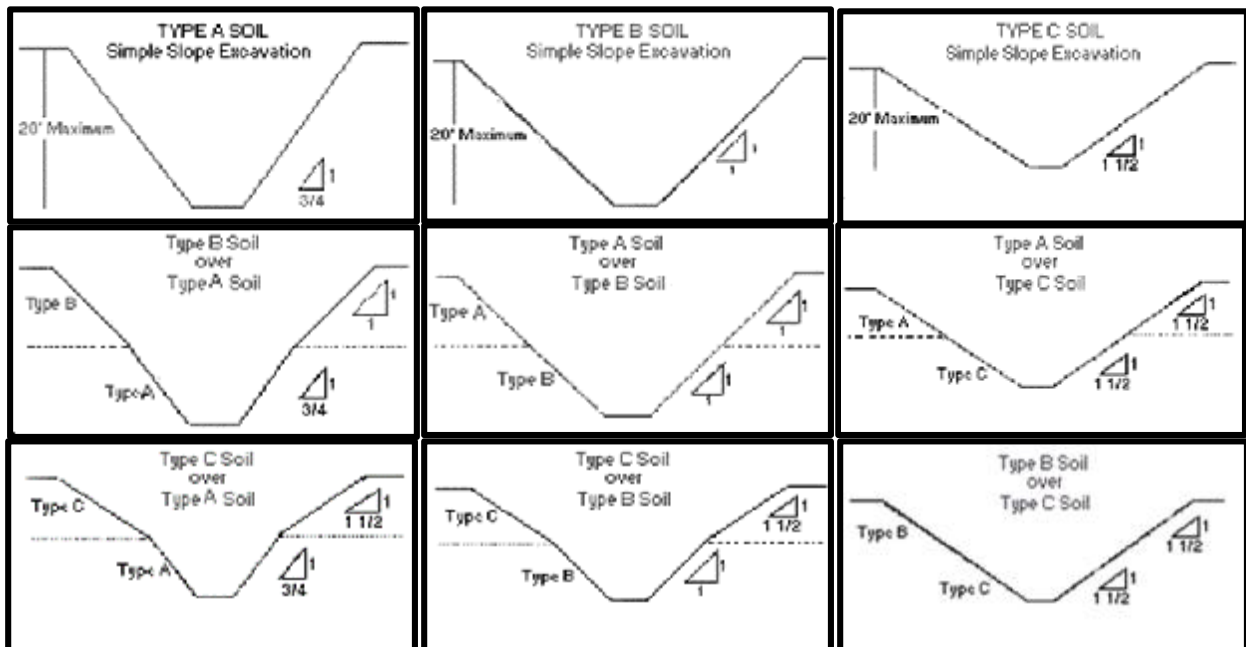
Sloping and Benching

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:

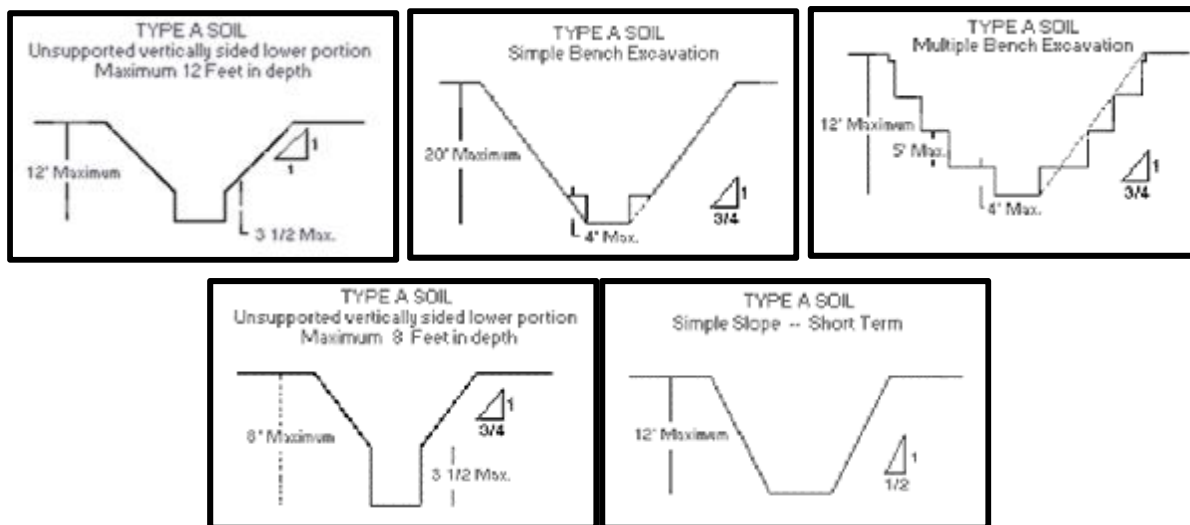
Allowable Slopes

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

Slope Configuration Excavations in Layered Soils



Excavations Made in Type A Soil

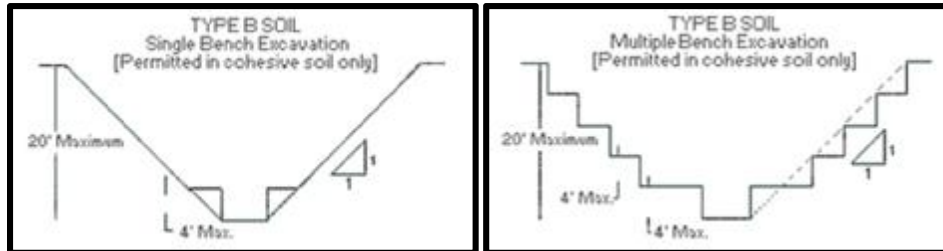


Benching. There are two basic types of benching, simple and multiple. The type of soil determines the horizontal to vertical ratio of the benched side.

As a general rule, the bottom vertical height of the trench shall 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

shall be below the maximum allowable slope for that soil type. For Type B soil the trench excavation is permitted in cohesive soil only.

Excavations Made in Type B Soil.

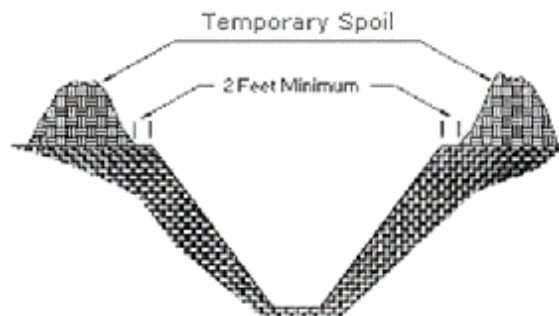


Spoil

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

Temporary Spoil



Permanent Spoil. Permanent spoil shall 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.

Special Health and Safety Considerations

Competent Person. The designated competent person shall have and be able to demonstrate the following:

1. Training, experience, and knowledge of:
 - a) soil analysis;
 - b) use of protective systems; and
 - c) requirements of 29 CFR Part 1926 Subpart P.
2. Ability to detect:
 - a) conditions that could result in cave-ins;
 - b) failures in protective systems;
 - c) hazardous atmospheres; and
 - d) other hazards including those associated with confined spaces.
3. Authority to take prompt corrective measures to eliminate existing and predictable hazards and to stop work when required.

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:

1. Vehicle crossings shall be designed by and installed under the supervision of a registered professional engineer.
2. Walkways or bridges shall be provided for foot traffic. These structures shall:
 - a) have a safety factor of 4;
 - b) have a minimum clear width of 20 in (0.51 m);
 - c) be fitted with standard rails; and
 - d) extend a minimum of 24 in (.61 m) past the surface edge of the trench.

Ingress and Egress. Access to and exit from the trench require the following conditions:

1. Trenches 4 feet or more in depth shall be provided with a fixed means of egress.
2. Spacing between ladders or other means of egress shall be such that a worker shall not have to travel more than 25 feet laterally to the nearest means of egress.
3. Ladders shall be secured and extend a minimum of 36 in (0.9 m) above the landing.

Exposure to Falling Loads. Employees shall be protected from loads or objects falling from lifting or digging equipment. Procedures designed to ensure their protection include:

1. Employees are not permitted to work under raised loads.
2. Employees are required to stand away from equipment that is being loaded or unloaded.
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.

Warning Systems for Mobile Equipment. The following steps shall be taken to prevent vehicles from accidentally falling into the trench:

1. Barricades shall be installed where necessary.
2. Hand or mechanical signals shall be used as required.
3. Stop logs shall be installed if there is a danger of vehicles falling into the trench.
4. Soil shall be graded away from the excavation; this will assist in vehicle control and channeling of run-off water.

Standing Water and Water Accumulation. Methods for controlling standing water and water accumulation shall be provided and consist of the following if employees are permitted to work in the excavation:

1. Use of special support or shield systems approved by a registered professional engineer.
2. Water removal equipment used and monitored by a competent person.
3. Safety harnesses and lifelines used.
4. Surface water diverted away from the trench.
5. Employees removed from the trench during rainstorms.
6. Trenches carefully inspected by a competent person after each rain and before employees are permitted to re-enter the trench.

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

1. Daily and before the start of each shift;
2. As dictated by the work being done in the trench;
3. After every rainstorm;
4. After other events that could increase hazards, e.g. snowstorm, windstorm, thaw, earthquake, etc.
5. When fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom, or other similar conditions occur;
6. When there is a change in the size, location, or placement of the spoil pile; and
7. When there is any indication of change or movement in adjacent structures.

Excavation Checklist

Description/Location of Excavation: _____

- All excavations 4 ft. or greater in depth require a competent person to complete this checklist prior to personnel entering the excavation.
- All answers to the check list shall be "Yes" or "N/A" prior to allowing personnel entry (shaded areas indicate N/A is not an option).
- The completed checklist shall be posted with the active Confined/Enclosed Space Entry Permit, and returned with the signed off permit to the Safety Department.
- If conditions change, the competent person shall re-evaluate the excavation.

NOTE: For J.F. Electric Use: All Soil is considered type "C"

	JOBSITE	YES	N/A
1.	Have all underground utilities been located and exposed by hand before mechanically digging?		
2.	If buildings, sidewalks, utility poles or other destabilizing forces are adjacent to the excavation, has a registered professional engineer been consulted to determine proper stabilization methods and have those methods been employed		
3.	Is a ladder or ramp within 25ft. of all entrants for proper access and egress?		
4.	Has proper atmospheric testing been performed?		
5.	Is the spoil pile at least 2 feet from the excavation?		
6.	Are utilities/piping crossing the excavation properly supported?		
7.	Is the excavation properly safeguarded by physical barriers or a designated monitor?		
8.	Have nearby vibration sources (equipment, vehicles, operating equipment, etc.) been eliminated or mitigated?		
9.	Have precautions been taken to protect workers from water accumulation? (e.g., continuous dewatering)		
10.	Has surface water/runoff been diverted or controlled to prevent accumulation in the excavation?		

	PROTECTIVE SYSTEMS (for excavations 5 feet or more in depth)	YES	N/A
1.	For excavations between 5 ft. and 20 ft. in depth, have proper systems to protect from cave-ins been utilized? (If yes, indicate below which protective system(s) is/are employed)		
	Sloping (minimum of 1 ½ horizontal to 1 vertical all sides and corners)		
	Shielding (e.g., trench box or other pre-engineered system)		
	Shoring (e.g., hydraulic or pneumatic system)		
2.	Is the top of the shielding/shoring higher than grade level? (Must be "yes" if shielded or shored.)		
3.	If the excavation is 20 ft. or deeper, has the protective system been designed by a registered professional engineer?		

Competent Person: _____ (Signature)

Print Name: _____

Company: _____

Date: _____

Time: _____ AM/PM

Bore Construction

1. It is the General Foreman or utility coordinators responsibility to inform affected residents, business, and property owners of your scope of work and how it will affect them. If an affected resident, business or property owner isn't home, place information tag on their door. Contact the city, building owners, local plumbers, maintenance personnel, and other persons that can provide assistance with identifying the existence and location of private utility lines (water, sewer, dog fence, irrigation). When available, obtain maps and drawings of the private utility lines (water, sewer, dog fence, irrigation). Maps can provide the depth of the private utility and other valuable information that can assist in determining the location of the private utility lines within the proposed path. Private utilities should be marked by the property owner. If the property owner refuses to locate their own utilities, the property owner shall be asked to sign a release holding J. F. Electric, Inc. harmless in the event of a private utility hit. If the property owner refuses to sign the release, approval to proceed shall be obtained from the owner, J. F. Electric is working for.
2. Access all outside sewer cleanouts and measure the depth of the sewer line lateral. Caution shall be taken because a sewer lateral may not have consistent grade from the building entrance to the sewer line. Access any manhole covers and measure the depth of the main sewer line Note: if any unmarked utilities are unidentified, immediately call the General Foreman, who will re-notify the one-call system. The coordinator shall re-notify the appropriate utility before the allowed number of days to start work expires. (The number of days allowed from notification to start of work varies from state to state. Failure to re-notify the utility prior to the expiration date of the start time period will result in a two (2) day delay by law.)
3. Establish running line and check route with hand locating unit to determine if all interferences have been identified.
4. All utilities marked to be crossed or parallel are to be exposed by hand digging or hydro-vac only. Identified utilities shall be exposed if the bore head and/or back reamer will operate within two (2) feet of the identified utility including sewer lines. The bore route must cross the utility in the exposed pot holes. Stop bore and redirect or stop bore and re-pothole if needed. If crew is parallel boring and the bore will enter the 24" window, the bore shall not continue until General Foreman notifies the utility and receives permission to proceed or if other method such as soft dig is needed.
5. Stop all boring operations if resistance or sudden movement of the boring equipment is encountered. Continue with boring operation only after the source of the resistance or sudden movement has been identified and/or eliminated. No heavy equipment, backhoe, etc. are to be used for this purpose.
6. In the event of a utility hit, immediately follow Underground Facility Damage Procedure.

Underground Facility Damage Procedure

Crew Members Are To Follow This Process Immediately Upon Hitting Any Underground Utility Including Electric, Gas, Water, Sewer, Telephone, Fiber, etc.

Stop All Digging Operations

Simultaneously Take The Following Steps:

- Call 911 For ALL GAS Leaks, and for other Utilities if Potential Danger to Public Exists
- Warn All Impacted Households if Potential Danger Exists
- Notify JF Electric Local Management (Field and Office) They shall: contact affected utility
- Contact the appropriate One Call System – Report type of damage and locate number for excavation.
- Initiate hit investigation process including..... Secure the area
- Take pictures of markings and excavation
- Measure distance between markings and excavation path
- Prepare thorough Property Damage Report of hit for management
- Send Responsible Crew Member for Drug Test (Standard Company Policy)

EMERGENCY NUMBERS (Use Only If Unable To Contact Local Management)

Missouri One Call:	1-800-344-7483 or 1-800-DIG-RITE
Illinois – JULIE:	1-800-892-0123
Ohio Utilities Protection Service:	1-800-362-2764
Kansas One Call:	1-316-687-2102 or 1-800-DIG-SAFE
All Other Areas:	CALL 811

POST THIS ON YOUR VEHICLE VISOR

Section III: Inside Department

Internal Reporting Procedure: Personal Injury/Vehicle/ Property/Near Miss

1. Employee immediately inform Foreman
2. Foreman/ immediately inform Project Manager
3. Project Manager is to contact the Safety Representative and the Department Manager
4. Employee, Foreman/General Foreman, Project Manager and Safety Representative prepare appropriate report, take photos of scene and submit both to the Safety Department within 24 hours.
5. Drug test the employee for the following:
 - a) personal injury
 - b) vehicle damage
 - c) property damage

MEDICAL ATTENTION (if required)

1. Emergency – *CALL 911*
2. Foreman/Project Manager take employee to designated medical facility

Note: Steps 1-4 shall be followed when an employee requires First Aid and/or reports a sprain and/or strain during their work shift.

Inside Department Disciplinary Policy

The following progressive discipline shall be administered for violations:

- 1st violation: Verbal warning (documented)
- 2nd violation: Written warning
- 3rd violation: Immediate removal from the job and three (3) day suspension
- 4th violation: Immediate removal from the job and dismissal. Employee may not be eligible for rehire up to one (1) year.

Note: Certain violations may be deemed serious enough to warrant immediate suspension or dismissal. JF Electric Inc. is not bound to follow the progressive discipline in those instances. The following violations at a minimum, shall warrant immediate suspension:

- Not wearing a hard hat
- Not wearing safety glasses with side shields
- Not documenting the job briefing
- Not in compliance with NFPA 70E
- Not properly following JF Electric or owner tie off procedures
- Not wearing required PPE for high hazard tasks (welding, cutting, drilling, etc.)
- Insubordination or horseplay

This policy is a modification of the existing JF Electric Inc. Disciplinary Policy (in the All Department Section of this manual), and defines more stringent penalties based on the nature of the work being performed. Please consult your supervisor immediately if you have any questions as to the requirements you are expected to follow.

Cranes, Derricks and Heavy Equipment

Some work may be too high, and some loads too large to manage without specialized equipment. Employees may be called upon to use a man-lift basket or other similar equipment to reach a work area, or assigned to operate cranes, pickers, or other approved lifting equipment.

Except where electrical equipment has been de-energized and visibly grounded at a point of work, or where insulated barriers have been installed to prevent contact with the lines, no part of a crane or its load shall be operated within 20 feet of an overhead line energized up to 50 kV

Rigging
JF Electric, Inc. shall comply with the manufacturer's specifications and limitations applicable to the operation of all cranes and hoists. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determination of a qualified engineer competent in this field and such determinations shall be appropriately documented and recorded. Attachments used with cranes shall not exceed the capacity, rating, or scope recommended by the manufacturer.

This program applies to all cranes including overhead cranes, gravity cranes, wall cranes and others having the same fundamental characteristics. Manufacturer rated load capacities and operating speeds shall be followed.

All cranes in service and utilized by JF Electric, Inc. shall meet, at a minimum, the design specifications of the American National Standard Safety Code for Overhead and Gantry Cranes, ANSI B30.2.0.

The use and operation of client owned cranes, hoists and rigging equipment by qualified JF Electric personnel will occur only at the express permission of the designated client representative.

Responsibilities

Managers and Supervisors

1. Ensure that only qualified employees operate cranes or hoists.
2. Are responsible to ensure that employees or sub-contractors who operate overhead cranes, hoists, and rigging equipment in the scope of their job duties and assignments are properly trained on the specific crane or hoist they will be operating and safe work practices while using rigging equipment.
3. Are responsible to see that all provision of this program are followed and that crane inspections are performed and equipment is in safe operating condition.
4. Are responsible for establishing a preventive maintenance program based upon the crane manufacture's recommendations for each crane or hoist.

Employees

1. Operators shall be physically fit, pass a physical, distinguish colors, pass a substance abuse test, pass a written test, and pass a practical exam before being qualified to operate cranes or hoists.
2. Operators shall understand and be able to use a load chart as well as calculate loads for the crane type they are operating and determine the correct rigging required for loads to be lifted.
3. Employees designated as crane operators are responsible for the entire lift. In addition, crane operators are responsible to:
 - a. Ensure all required inspections are completed,
 - b. Report any damage or needed repairs immediately to their supervisor, and
 - c. Ensure that all personnel working in the area around the crane are kept clear of all hazards related to crane operations.

Inspections

Initial inspection and test shall be performed by a qualified third party.

Prior to initial use all new and altered cranes shall be inspected and tested to ensure compliance with the provisions of 29 CFR 1910.179 and ANSI B30.2.

Cranes and hoists that have been overloaded shall be inspected prior to being returned to service.

Only after determining by this inspection, testing and proper documentation, that the crane is in safe operating condition, shall it be put into service.

Modifications or additions which affect the safe operation of the equipment may only be made with the manufacture's written approval.

JF Electric, Inc. shall:

1. Make and keep monthly inspection records on critical items in use such as brakes, crane hooks and ropes.
2. Perform rope inspections once a month and certify the date and signature of the competent person performing the inspection.
3. Make a monthly inspection and keep a record of hoist chains (including end connections) for excessive wear, twist, distorted links interfering with proper function and stretch beyond manufacture's recommendation. The certification records shall include date of inspection, signature of person performing inspection and identifier of chain inspected.
4. Make monthly inspections and keep a record of all hooks. The certification records shall include date of inspection, signature of person performing inspection and the serial number or other identifier of the hook inspected.
5. Quarterly and annual inspections shall be documented with a certification record which includes the signature of the qualified third party (person or agency) who performed the inspection, the date, and identifier (serial number or unit number, etc.) for each piece of equipment. If safety hazards are found during inspections, the equipment in question shall be tagged out and not used until repairs are made. Any deficiencies constituting a

safety hazard shall cause the equipment to be tagged out of service until repairs are made.

6. Keep and maintain written reports on rated load tests showing the test procedures and confirming the adequacy of any repairs or alterations. All maintenance and repair records shall be retained for the life of the equipment.
7. Keep and maintain certifications records on running ropes which includes the date of the inspection and the signature of the person(s) who performed the inspection.
8. Inspect all rope which has been idle for a period of a month or more due to shut down or storage of a crane on which it is installed before use. The inspection shall be for all types of deterioration and shall be performed by an appointed or authorized person whose approval shall be required for further use of the rope.

Precautions shall be taken before repairs are started. If any unsafe condition is found or repairs are necessary, "Warning" or "Out of Order" signs shall be placed on any crane or other hoisting equipment. Any key that allows operation of the equipment shall be secured to prevent unsafe starting of equipment by using the Lock Out/Tag Out program.

Rigging and Sling Inspections and Safety Requirements

Each sling, fastenings and all attachments shall be inspected by a designated competent person by JF Electric, Inc.

1. All rigging equipment shall be inspected before use and annually by the assigned competent person.
2. The load capacity limits shall be stamped or affixed to all rigging components.
3. Defective equipment is to be removed from service and destroyed to prevent inadvertent reuse.

All devices shall be visually inspected prior to use and removed from service for any of the following conditions and to ensure the proper use and care:

1. Synthetic slings with:
 - a. Abnormal wear.
 - b. Torn stitching
 - c. Broken or cut fibers
 - d. Discoloration or deterioration
2. Wire rope slings with:
 - a. Kinking, crushing, bird caging, or other distortions
 - b. Evidence of heat damage
 - c. Cracks, deformation, or worn end attachments
 - d. Six randomly broken wires in a single rope lay
 - e. Three broken wires in one strand of rope
 - f. Hooks opened more than 15% at the throat
 - g. Hooks twisted sideways more than 10 degrees from the plane of the unbent hook

3. Alloy steel chain slings with:
 - a. Cracked, bent, or elongated links or components
4. Cracked hook
5. Shackles, eye bolts turnbuckles, or other components that are damage or deformed.

Operational Procedures

Pre-use Inspection

Daily pre-use inspections shall be performed by the crane operator (designated as JF Electric designated competent person) prior to beginning shift and through observation during normal operation. Daily inspections shall be documented on the "Daily Safety Checklist". All discrepancies shall be corrected before the crane or hoist can be put into normal operation. Lock out or tag out before any repair of any crane or hoist that fails any items on the "Daily Safety Checklist". Any deficiencies shall be repaired, or defective parts replaced, before continued use.

Safe Work Practices

Only qualified personnel shall operate cranes and equipment covered by this program.

Operators shall comply with the following safety rules while operating cranes and hoists:

1. Employees shall not be exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres when internal combustion engine powered equipment is used. Test shall be conducted and documented.
2. Do not engage in any practice that will divert your attention while operating the crane.
3. Respond to signals only from the person who is directing the lift or any appointed signal person.
4. Obey a stop signal at all times, no matter who gives it.
5. Do not move a load over people.
6. People shall not be placed in jeopardy by being under a suspended load.
7. 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.
8. Have a crane or hoist operator remain at the controls or lock open and tag the main electrical disconnect switch.
9. Ensure that the rated load capacity of a crane's bridge, individual hoist, or any sling or fitting is not exceeded.
10. Know the weight of the object being lifted.
11. Check that all controls are in the OFF position before closing the main line disconnect switch.
12. If spring-loaded reels are provided to lift pendants clear of the work area, ease the pendant up into the stop to prevent damaging the wire.
13. Avoid side pulls. These can cause the hoist rope to slip out of the drum groove, damaging the rope or destabilizing the crane or hoist.

14. 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.
15. Cranes or hoists shall not be loaded beyond their rated capacity for normal operations.
16. Workers shall not ride a moving bridge crane
17. Personnel shall not board any bridge crane unless the main disconnect switch is locked and tagged out of service.
18. A substantial and durable Load Rating Chart with clearly legible letters and figures shall be provided with each crane and securely fixed in and onto the crane cab in a location easily visible to the operator while seated at this control station.
19. When operating cranes near power lines rated 50 kV or below, the minimum clearance between the power line and any part of the crane or load shall be 20 feet.
20. When operating cranes near power lines rated above 50 kV, the clearance between the power line and any part of the crane or load shall be 20 feet plus 4 inches for every 10 kV over 50 kV.
21. Ensure the fire extinguisher recommended by the manufacturer is installed with easy access in the cab or within the vicinity of the crane or hoist controls.

Rigging a Load

Whenever any sling is used specific safety practices shall be observed:

1. Determine the weight of the load – do not guess.
2. Determine the proper size for slings and components.
3. Do not use manila rope for rigging.
4. Ensure the shackle pins and shouldered eyebolts are installed in accordance with the manufacturer's recommendations.
5. Ensure that ordinary (shoulder-less) eyebolts 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.
8. 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.
9. Wood, tire rubber, or other pliable materials may be suitable for padding.
10. Do not use slings, eyebolts, shackles, or hooks that have been cut, welded, or brazed.
11. Install wire-rope clips with the base only on the live end and the U-bolt only on the dead end.
12. Follow the manufacturer's recommendations for the spacing for each specific wire size.
13. Determine the center of gravity and balance the load before moving it.
14. Initially lift the load only a few inches to test the rigging and balance.

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.
2. Inspect the drum to verify that the cable is in the grooves.
3. Use a tag line when loads must traverse long distances or must otherwise be controlled.
4. Manila rope may be used for tag lines.
5. Plan and check the travel path to avoid personnel, obstructions, and overhead power lines.
6. Lift the load only high enough to clear the tallest obstruction in the travel path.
7. Start and stop slowly.
8. Land the load when the move is finished.
9. Choose a safe landing area.
10. Never leave suspended loads unattended.
11. In an emergency where the crane or hoist 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.

Parking a Crane or Hoist

1. Remove all slings and accessories from the hook.
2. Return the rigging device to the designated storage racks.
3. Place the emergency stop switch (or push button in the OFF position).

Any crane or hoist suspected of having been overloaded shall be removed from service by locking open and tagging the main disconnect switch. Before an overloaded crane or hoist can be put back into service, it shall be inspected, repaired, load tested, and approved.



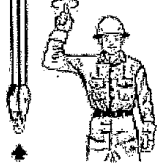
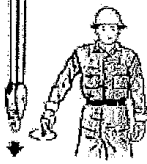
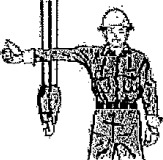
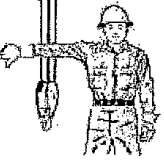
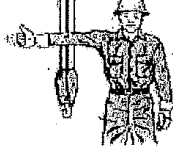
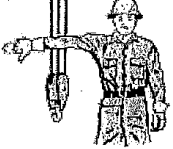

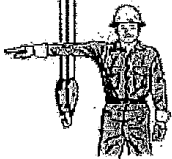
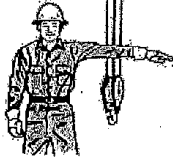
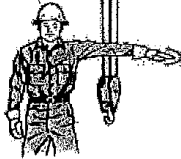
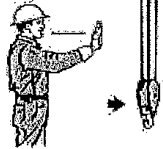
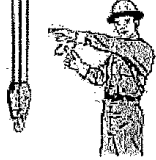
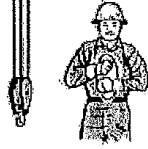





Working at heights on cranes or hoists

1. Anyone conducting maintenance or repair on cranes or hoists at heights greater than 4 ft. shall use fall protection.
2. Fall protection includes safety harnesses that are fitted with a lifeline and securely attached to a designated anchorage point.
3. Properly secured safety nets are another option for fall protection.

Hand Signals

Hand signals shall be consistent. Communicate the signals you will be using before the pick. Compare your hand signals with the ones posted in the cab of the crane or other lifting device. (Hand signals shall only be given by a trained designated employee).

Hand Signal Chart

 <p>USE MAIN HOIST - Tap fist on head, then use regular signals.</p>	 <p>USE WHIPLINE - (Auxiliary Hoist) Tap elbow with one hand, then use regular signals.</p>	 <p>HOIST - With forearm vertical, forefinger pointing up, move hand in small horizontal circle.</p>	 <p>LOWER - With arm extended downward, forefinger pointing down, move hand in small horizontal circles.</p>
 <p>RAISE BOOM - Arm extended, fingers closed, thumb pointing upward.</p>	 <p>LOWER BOOM - Arm Extended, fingers closed, thumb pointing downward.</p>	 <p>RAISE THE BOOM & LOWER THE LOAD - With arms extended, thumb pointing up, flex fingers in and out as long as load movement is desired.</p>	 <p>LOWER THE BOOM & RAISE THE LOAD - With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.</p>
 <p>DOG EVERYTHING - Clasp hands in front of body.</p>	 <p>SWING - Arm extended point with finger in direction of swing of boom.</p>	 <p>STOP - Arm Extended, palm down, hold position rigidly.</p>	 <p>EMERGENCY STOP - Arm extended, palm down, move hand rapidly right and left.</p>
 <p>TRAVEL - Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.</p>	 <p>MOVE SLOWLY - Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example)</p>	 <p>TRAVEL (Both Tracks) - Use both fists in front of body, making a circular motion about each other, indicating direction of travel: forward or backward. (For crawler cranes only)</p>	 <p>TRAVEL (One Track) - Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist, rotated vertically in front of body. (For crawler cranes only)</p>
 <p>EXTEND BOOM (Telescoping Booms) - Both fists in front of body with thumbs pointing outward.</p>	 <p>RETRACT BOOM (Telescoping Booms) - Both fists in front of body with thumbs pointing toward each other.</p>	 <p>EXTEND BOOM (Telescoping Boom) - One hand signal. One fist in front of chest with thumb tapping chest.</p>	 <p>RETRACT BOOM (Telescoping Boom) - One hand signal. One fist in front of chest thumb pointing outward and heel of fist tapping chest.</p>

Heavy Equipment

All heavy equipment shall be maintained in accordance with manufacturer specifications. An inspection of heavy equipment shall be conducted by a J. F. Electric mechanic prior to delivery at a job site.

Employees operating heavy equipment shall be familiar with its operation and safety features and responsible for inspecting the equipment before it is put into service.

A thorough inspection shall be conducted by a J. F. Electric mechanic or other authorized mechanic on a regular basis. Inspection documentation shall be maintained in the equipment file. Modifications to heavy equipment shall be made only upon the written recommendation of the manufacturer, with all related documents being retained in the appropriate file.

Leased or rented pieces of heavy equipment shall not be offloaded unless copies of required inspections are delivered along with the equipment. This information shall be kept at the job site, with copies sent to the corporate offices for inclusion in the job file.

High Voltage/Utility Work

When required to work with high voltage, refer to the guidelines contained in the Utility Line Department High Voltage/Utility Work Section of this Safety Manual.

Personal Protective Equipment Policy

It is the policy and intent of J. F. Electric, Inc. to ensure that the health and well-being of all employees is protected to the greatest extent possible through the proper selection and use of personal protective equipment. Personal protective equipment (PPE) shall be provided and all employees shall use all personal protective equipment which is required for the specific task being performed. Employees shall get management's approval to use employee-owned PPE.

Hazard Assessments

Each workplace shall be assessed to determine if hazards are present or likely to be present during the project which would necessitate the use of personal protective equipment. If such hazards are identified, affected employees shall use the types of personal protective equipment that will protect against the identified hazards. Hazard assessment reports shall be maintained in the job file. (See PPE Assessment Matrix within the All Department Section of the JF Electric, Inc. Safety Manual).

Hard Hats

All employees are required to wear an approved company issued hard hat while on a construction site except when inside an enclosed vehicle. The Class E hard hat prevents injury to the head from falling objects and exposed electrical conductors which could contact the head.

Hard hats shall be worn under welding helmets and when wearing face shields.

Eye and Face Protection

Safety glasses with side shields shall be worn on all job sites. For additional eye and face protection, goggles, face shields, welding helmets, or a combination of them shall be used. A combination of goggles and a face shield provides the highest level of protection.

Impact resistant goggles shall be worn whenever an employee is working with air powered tools, grinding tools, drilling tools and cutting tools. A face shield can also be used with the goggles.

When working above the shoulder where there is a potential for rust or debris to fall or be propelled into the eye, safety glasses with side shields and a face shield or goggles shall be worn.

When welding, safety glasses with side shields shall be worn under the welding hood.

Hearing Protection

Refer to All Departments section of this JF Electric, Inc. Safety Manual for hearing protection.

Foot Protection

Refer to All Department section of this JF Electric, Inc. Safety Manual for footwear protection. Employees shall wear protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects, objects piercing the sole, and where employee's

feet are exposed to electrical hazards. Approved footwear shall consist of sturdy work type boots or shoes with a hard sole, leather type uppers and ankle support.

Sandals, light weight fabric, and athletic shoes shall not be worn on job sites.

Safety toe shoes, non-conductive safety toe shoes, metatarsals, etc. shall be worn when required by owner or general contractor. (non-conductive safety shoes do not have a steel shank or steel toe)

Clothing

At a minimum, all employees are required to wear long pants and a short sleeved shirt. In some instances, due to owner requirements, long sleeve shirts will be mandatory. Clothing shall be appropriate for the work environment.

Any employee who could be exposed to flames or electric arcs shall wear clothing that is arc resistant. Employees shall be prohibited from wearing clothing made with the following types of fabrics:

- Acetate
- Nylon
- Polyester
- Rayon

Jewelry, rings, watches, bracelets, earrings or neck chains shall not be worn when working with moving machinery, or within reaching distance of exposed energized equipment and/or conductors.

Fall Protection

In all cases where an employee is exposed to a fall hazard at four (4) feet or more, and where guard rails or other fall protection is not in place, fall protection equipment is required.

All workers four feet (4') or higher shall be protected from falling.

Fall protection equipment shall be inspected before each use and annually by a competent person for excessive wear or damage. Damaged or worn equipment shall be removed from service immediately.

It is important that fall arrest equipment be worn properly and that the wearer allows no more slack in the secured lanyard than is necessary.

Personal Fall Arrest Systems shall be rigged so that the worker can neither fall six (6) feet nor contact a lower level.

Positioning devices shall be rigged to prevent free falls more than two (2) feet.

Hand Protection

When employees' hands are exposed to hazards of cuts, burns or caustic substances, appropriate hand protection shall be used.

All job trailers shall be stocked with gloves to be issued by the Foreman, as needed.

When performing work in or around energized wires or equipment, approved rubber gloves with leather protectors shall be worn.

Training

PPE training shall indicate when PPE is necessary, what PPE is necessary, and the proper care, fitting, maintenance, useful life, and disposal of PPE.

Retraining of the employee is required when the workplace changes, when the type of PPE changes, or when the employee demonstrates lack of use, improper, or insufficient skills or understanding.

PPE shall be inspected daily and defective or damaged PPE shall not be used.

Respirator Program

This program provides guidelines for the prevention of respiratory injury or disease caused by breathing air contaminated by worksite processes.

J. F. Electric, Inc. shall provide respirators to all employees where required. Employees shall use the provided respirators in accordance with the instructions and training provided to them.

Equipment

The type of equipment to be used shall be selected specifically for the hazards present.

When cartridge type respirators are selected, the type of atmospheric contaminants shall be defined and the filter cartridge selected accordingly.

Filter cartridges shall be replaced as necessary so as to avoid undue resistance to breathing.

Fitness

Employees shall be given a physical exam by a physician verifying the employee's fitness to use a respirator, and certification of the results.

Spirometer tests for lung capacity is required.

When working in certain hazardous areas, blood tests shall be required before work begins.

After the job is completed a blood test shall again be required.

Respirator fit testing for the type and size of respirator to be used is required.

Employees shall be refit tested every six (6) months, as required.

All tests shall be coordinated and scheduled by the Safety Department.

Training

1. Before an employee can use a respirator, they shall be instructed in the proper use of that respirator.
2. Training shall include, but not be limited to:
 - a) Proper fit
 - b) Type of airborne contaminants to be protected against
 - c) Hazards associated with that contaminant
 - d) Limitations of equipment
 - e) Emergency procedures
 - f) Maintenance

g) Sanitation

3. Training shall be in accordance with the respirator manufacturer's recommendations.

Sanitation and Maintenance

Respirators shall be cleaned and disinfected after each use.

Respirators used by more than one person shall be cleaned using a germicidal solution.

During cleaning, respirator shall be thoroughly inspected. Worn or deteriorated parts shall be replaced.

After respirators are washed and dried, they shall be individually wrapped in plastic bags and stored in a clean, dry place.

Employees are responsible for the sanitation and maintenance of the respirators.

Surveillance and Monitoring

In operations requiring the use of respirators, employees shall be monitored to ensure that exposures remain within the capabilities of the equipment, and that employees are not subjected to excessive respiratory stress.

Effectiveness

The respiratory protection program shall be evaluated regularly by the Safety Department to determine its continued effectiveness.

Fall Protection Plan

Every effort shall be made to eliminate fall hazards on each job site. If the elimination of fall hazards through engineering is not possible, a Fall Protection Plan shall be written for each specific location, as required. A personal fall arrest system shall be used when possible. If it is not feasible to utilize, contact your Safety Representative for an alternative selection of fall protection.

Personal Fall Arrest System (PFAS)

This system shall rely on the use of full body harnesses, shock absorbing lanyards and the use of a pass through tie off adapter.

Employees shall tie off their personal fall arrest system to anchorage points specifically provided for that purpose. If anchorage points are not provided, employees shall tie off to structural members of the job site that can withstand a force of 5000 lbs. per employee attached to that anchorage point or structural member.

Additional requirements for (PFAS)

Personal Fall Arrest Systems shall be inspected for wear, damage or deterioration prior to each use.

Damaged harnesses, lanyards, lifelines or anchor points shall be immediately removed from service, labeled "Dangerous – DO NOT USE". Equipment which cannot be repaired shall be destroyed.

Personal Fall Arrest Systems shall limit a worker's free-fall distance to six (6) feet without contacting a lower level.

Any PFAS or component subjected to a fall shall be immediately removed from service. Lanyards cannot be clipped or tied back to itself unless they are designed to do so.

Warning Line System

The following safety precautions are intended to inform personnel working on rooftops of the requirements necessary to safely perform work:

- a) During the Pre-Work Assessment Survey, rooftop anchorage points shall be identified and documented on the Rooftop Fall Protection Checklist.
- b) The existing parapet wall or guardrail system shall be at least 39 inches in height and protect employees while working on a rooftop.
- c) A warning line system shall be employed 15 feet from the roof's unprotected side/edge. The warning line system shall meet the following requirements:
 - The warning line shall be flagged at not more than 6-foot (1.8m) intervals
 - The warning line shall be positioned between 34 and 39 inches from the working surface.
 - The warning line supports shall be capable of resisting a force of at least 16 pounds.
 - The warning line shall have a minimum tensile strength of 500 pounds.
- d) Points of roof access shall be connected to the work area by a path formed by two warning lines.
- e) A PFAS connected to an adequate anchorage point shall be utilized for all rooftop work outside the warning line.
- f) Fall hazards including roof openings, skylights, access hatches, etc., shall be covered, barricaded or exposed workers equipped with proper PFAS.
- g) Roof openings covers shall meet the following requirements:
 - Able to withstand at least twice of the weight of employees, equipment, and materials.
 - Secured to prevent accidental displacement.
 - Marked with the word "Hole" or "Cover".
 - Equipment and materials shall be kept away from the roof's edge.

Training

The Safety Department shall provide Fall Protection training to all employees. The training shall be documents and added to the employee's training records. The following areas shall be covered during the training:

1. Recognition of fall hazards
2. Avoidance of fall hazards using safe work practices

3. Recognition of unsafe conditions (inclement weather, high winds, etc.)
4. The function, use and operation of
 - a) Full body harness
 - b) Shock absorbing lanyards
 - c) Guardrails
 - d) Warning line system

Employees shall be re-trained when any of the following are noted:

1. Deficiencies in training
2. Work place changes
3. Fall protection systems or equipment changes that render previous training obsolete

Incident Review

If fall accidents or serious incidents (near miss) occur, it shall be investigated and changes shall be made to the Fall Protection Plan as necessary.

Note: Use Employee Incident report when conducting a "Near Miss" investigation.

Energized Electrical Work Safety Program

Policy

This electrical safety program is designed to help keep employees safe when required to work in the presence of electrical energy.

The program is designed for employees who perform work on or near exposed energized electrical conductors and circuit parts greater than 50 volts.

Purpose

This program has been established to ensure that electrical work on energized parts is performed only when necessary, and every alternative means to carry out de-energized work has been considered and eliminated, and to establish safeguards that shall identify and control all hazards encountered in testing, maintenance, service and all other work involving exposure to energized electrical parts.

Scope

This program applies to all Inside Department personnel within J.F. Electric, Inc.

Definitions

Qualified Person: One who has received training in and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations and hazards involved. A person can be considered qualified in respect to certain equipment and methods and still be unqualified for others.

Authorized Persons: An Authorized Person shall meet all of the requirements of a Qualified Person. In addition, they shall be authorized by JF Electric, Inc. to perform certain tasks.

Energized Electrical Work: Any work on electrical equipment, circuits, devices, systems, or any other energized part(s) where an employee is required to deliberately, or could accidentally, place any part of his body, tool or material into or around such electrical devices where the voltage has been deemed to be in excess of 50 volts.

Flash Suit: Protective clothing that provides for easy and rapid removal. The entire flash suit including the window shall have energy absorbing characteristics that are suitable for the arc-flash exposure and shall be supplied by the company.

Electrically Safe Work Condition: Current carrying parts that are free from any direct connection to a source of voltage or from electric charge; not having a potential different than that of the earth.

Electrical Hazard: This is recognized to include three separate hazard categories:

1. Electric Shock
 - a) by simultaneous contact with both the energized ungrounded and grounded conductors.
 - b) by contact with one of the energized conductors and the ground,
 - c) by being in series with an energized conductor and
 - d) by contact with a metallic part that has become energized by an energized conductor while also in contact with the ground.
2. Electric Arc: Arcing faults or "flash" burns are generated as a result of inadequate electrical contact or poor insulation, from phase to ground or phase to phase, as short-circuit current surges through vaporized metal and carbon. Arc temperatures can reach 35,000 degrees F. The length and duration of the arc will vary.
3. Arc Blast: Tremendous air pressure is developed as a result of the instantaneous occurrence of an electric arc, in the form of a shock wave that may cause property damage, injury or death.

Energized: Electrically connected to a source of voltage or otherwise electrically charged with a potential noticeably different than that of the earth.

Arc Resistant Clothing: Protective clothing that meets all the requirements of NFPA 70E and ASTM F 1506 and has been labeled specifically with:

1. The tracking identification code system
2. Identified ad meeting the requirements of NFPA 70E/ASTM F 1506
3. Manufacturers Name
4. Size and other associated standard labeling
5. Care instructions
6. Fiber content

The clothing shall be designed for easy and rapid removal.

Protective clothing includes shirts, pants, coveralls and jackets, routinely worn by workers who, under normal working conditions, could be exposed to momentary electric arc and related thermal hazards.

Testing Equipment: Only testing equipment that bears the identifying mark of a recognized testing laboratory shall be used in field operations. It shall be rated for the circuits and equipment voltage and amperage to which they will be connected.

Trouble Shooting: The testing of energized electrical circuits known as troubleshooting shall be confined to the purpose of diagnostic readings of voltage, amperage and phase rotation. All methods of safe work practices shall be employed during this procedure, and the energized parts shut down and locked out for subsequent repair or additional work.

Requirements

Energized electrical work includes working on or near any energized electrical system, whether alternating or direct current, including, but not limited to, service entrance sections, distribution switchgear, transformers, distribution panels, UPS Systems and branch circuit wiring. They may include, but not be limited to:

1. Voltage Testing,
2. Circuit Testing,
3. Trouble-shooting,
4. Power switching,
5. De-energizing and Re-energizing Equipment,
6. Pushing fish tapes or pushing/pulling wire into an energized enclosure,
7. Work performed on energized enclosures,
8. Excavations near underground electrical lines.

All circuits, equipment, devices and other apparatus shall be placed into an electrically safe work condition before any work can be performed. If the equipment cannot be placed into an electrically safe work condition, a Hazard/Risk Analysis shall be performed and approved by management. No management approval shall be granted unless all requirements of the Energized Electrical Work Safety Program have been satisfied.

An electrically safe work condition shall be achieved when performed in accordance with J.F. Electric, Inc. and NFPA 70E policy and the following conditions have been met:

1. Determine all possible sources of electrical supply to the specific equipment.
2. Check applicable up-to-date drawings, diagrams, and identification tags.
3. After properly interrupting the load current, open the disconnecting device(s) for each source.
4. Where it is possible, visually verify that all blades of the disconnecting devices are fully open or that draw-out type circuit breakers are withdrawn to the fully disconnected position.
5. Apply lockout/tagout devices in accordance with company lockout/tagout policy.
6. Use an adequately rated voltage detector to test each phase conductor or circuit part to verify they are de-energized. Before and after each test, determine that the voltage tester is operating satisfactorily. Proximity detectors shall be permitted for preliminary testing but shall not be considered an adequately rated voltage detector. An additional test with an adequately rated voltage detector shall be required when a proximity tester has been utilized.
7. Where the possibility of induced voltages or stored electrical energy exists, ground the phase conductors or circuit parts before touching them. Where it could be reasonably anticipated that the conductors or circuit parts being de-energized could contact other exposed energized conductors or circuit parts, apply ground- connecting devices rated

for the available fault or insulate the conductor or circuit parts with appropriate cover up.

Only Qualified Persons are permitted to work on electrical conductors or circuit parts that have been de-energized and locked out. Apprentices under direct supervision of a journeyman may perform the work after a Qualified Person has tested for zero state and the circuit has been locked out by following the JF Electric Lockout/Tagout policy.

Only Authorized Persons are permitted to work on electrical conductors or circuits that cannot be placed in an electrically safe work condition.

All equipment shall be installed and used in accordance with the manufacturer's instructions.

Steps shall be taken to maintain electrical equipment's insulation and enclosure integrity.

All work on equipment that is energized at 50 volts or more shall be planned and documented according to the procedures of this program.

Every attempt shall be made to protect employees from shock, burn, arc-blast and other hazards that are present in this working environment. Employees shall be responsible for protecting themselves from such hazards with the assistance and supervision of management, and personal adherence to the policies and procedures set forth in this manual.

All employees shall use only the appropriate equipment to accomplish an assigned task.

The true effectiveness of any safety program relies upon the execution and acceptance of the policy by the employees affected. This program shall be audited annually and revised as needed. Management shall encourage input from all employees concerning safety procedures and policies.

Training is essential to employee safety. The company shall strive to provide up-to-date training to employees on an annual basis. Employees shall keep current on personal protective equipment, safety policies and techniques and potential hazards.

The Energized Electrical Work Safety Program shall not replace any part of Company Policy. All references to NFPA 70E shall be inclusive of this program.

Hazard Control

Control of electrical hazards shall be established and observed by all employees to minimize hazards from electrical energy:

Engineering Controls

1. Approved clearances shall be established for all distribution panels and equipment.

2. Electrical rooms, vaults and areas containing equipment shall be guarded against unauthorized entrance by suitable barriers and structural means.
3. Electrical installations shall conform to the requirements of the NEC, including support requirements for all conduit and equipment.
4. Adequate lighting shall be maintained in all areas where energized work is performed.
5. All enclosures, including junction boxes, switches, panels, etc. shall be properly maintained in order to safely contain energized parts. Shock injuries may be caused by poorly grounded or ungrounded electrical equipment. The grounding system integrity shall be verified on all equipment.

Administrative Controls

1. Every electrical conductor or circuit part shall be considered energized until proven otherwise.
2. De-energized conductors and equipment that have not been locked out or tagged shall be treated as energized.
3. No employee is to make bare handed contact with exposed energized electrical conductors or circuit parts above 50 volts to ground.
4. All employees shall follow established electrical safety requirements set forth in the Energized Electrical Work Safety Program.
5. J.F. Electric, Inc. shall train employees to qualify them for working as Authorized Persons, and shall establish records and procedures to ensure that only Authorized Persons engage in work on energized electrical parts.
6. Access to electrical rooms or other areas engaged in energized work, is limited to Authorized Persons.
7. Housekeeping duties shall not be performed at close distances to energized parts unless adequate barriers and insulating equipment are employed.
8. Physical barriers and warning signs shall be used to prevent unauthorized entry to areas where energized work is being performed.
9. Violation of the safety policies and work procedures set forth in this program shall be considered willful misconduct and subject to disciplinary action, up to and including dismissal.

Protective Equipment

Only insulated tools that are designed and rated for the appropriate voltages shall be used on energized circuits, equipment or systems.

Metal belt buckles, jewelry, key chains, cell phones, pagers, etc., shall be removed when working on energized circuits or equipment. Petroleum base hand cleaner or lotion shall not be used when wearing rubber gloves to prevent damage to the rubber.

Rubber gloves and leather protectors shall be stored in proper canvas bags

Rubber blankets shall be stored in protective tubes.

Voltage rated tools shall be clean and have a smooth finish with no breaks in the insulation. These tools shall be stored separately or in protective devices to avoid damage from other tools or materials.

Energized Work Procedures

The following procedures shall apply to all work on, or close to exposed and energized electrical conductors or circuit parts. Additional procedures may be needed for specific tasks.

Employees shall exhaust every reasonable effort to perform work de-energized.

If the decision is made to work on the circuit, equipment or system energized, then refer to the Energized Electrical Work Safety Program.

The owner/general contractor shall participate in any decision to carry out work on energized electrical parts. A signature should be obtained from the owner/general contractor on the JF Electric Energized Electrical Work Permit.

The qualifications and the number of employees that will be involved in the work shall be established and Authorized Person(s) shall be selected for the work.

The work hazards and the extent of the risk shall be thoroughly examined.

The Energized Electrical Work Permit form shall be completed, and approved. This form shall be reviewed by each employee performing the work and shall be maintained in the immediate work area.

Ensure the appropriate personal protective equipment has been obtained as outlined in the Energized Task Assessment Guide.

Manufacturer's instructions and equipment details shall be reviewed prior to any work being performed.

All available electrical plans/drawings shall be reviewed prior to any work being performed.

Appropriate barricades, signs and warning tape shall be installed in order to restrict the area to unauthorized personnel as well as create safe working space for Authorized Persons.

If the Authorized Person requires assistance, he or she shall wear the same PPE as the Authorized Person performing the work.

Once the work is completed, the energized equipment PPE kit shall be returned to the office.

Hazard Analysis Procedure

The employees involved in work on or near electrical energized conductors or circuit parts shall be responsible for completing an Energized Electrical Work Permit and submitting it to management for approval before any work may be performed.

The owner and/or the general contractor shall be briefed of the potential hazards to persons and property.

A copy of the Energized Electrical Work Permit shall be given to the owner and/or the general contractor. No work shall begin prior to receiving the approval/signature of the owner and/or general contractor.

Work may only begin after management approval on the Energized Electrical Work Permit.

Involved Employees: All employee names, involved in the work shall be on the Energized Electrical Work Permit and shall review all the documentation and receive task specific training necessary for the work to be performed. Each employee shall sign the permit after completion of this training and review.

Reference Material

The Electrical Safety Program was developed with the guidelines set forth in National Fire Protection Association Publication NFPA 70E Standard for Electrical Safety Requirements for Employee Workplaces. Exact details for determining the approach boundaries, flash hazard boundary, personal protective equipment specifications and details for specific installations may be obtained from this document.

J.F. Electric employees are encouraged to consult NFPA 70E before working on energized electrical equipment or circuit parts.

- NFPA 70E 2-3.1.1 Standard for Electrical Safety Requirements for Employee Workplaces
- NFPA 70E 3-3.9.4
- ASTM F 1506 Standard Performance Specification of Textile Materials for Wearing Apparel for Use by Electrical Workers Exposed to Momentary electric Arc and Related Thermal Hazards
- NFPA 70E Table 3-3.8
- NFPA 70E 3-3.9.5
- NFPA 70E 1-5.4.1
- NFPA 70E 1-5.4.1
- NFPA 70E 1-5.4.1 (Note)
- NFPA 70E 2-1.1.3
- NFPA 70E 2-1.3.2 Part II

J.F. Electric Energized Electrical Work Permit

Electrician(s) performing Energized Work:		
Owner/General Contractor		
Customer is aware of Energized Work being performed:		
System Voltage and Available Fault Current		
Job Name and Project Number:		
Energized Work is being performed on:	Date:	Time:

Explain work to be performed (e.g. trouble shooting 120/208, Pulling wire into panel, etc.):

Safety Considerations and Personal Protective Equipment (PPE) Required: (Check all that apply)

Check	Type of Safety Equipment and PPE Required and Used	Check	Type of Safety Equipment and PPE Required and Used
<input type="checkbox"/>	Rubber Gloves with Leather Protectors	<input type="checkbox"/>	Signage, Barriers and Guards are properly placed to isolate hazardous area.
<input type="checkbox"/>	AR Clothing with Face Shields or Hood	<input type="checkbox"/>	Energized Work Tools.
<input type="checkbox"/>	Rubber/Blankets	<input type="checkbox"/>	Voltage, Amp and Phase Rotation Meters are in operational condition and have been tested.
<input type="checkbox"/>	Safety Glasses	<input type="checkbox"/>	Other employees in the area have been informed of Energized Work to be performed.
<input type="checkbox"/>	Hearing Protection	<input type="checkbox"/>	All employees assigned to perform work or assist have been briefed on JSA.
<input type="checkbox"/>	Lockout/Tagout Equipment placed on all circuits. (if-applicable)	<input type="checkbox"/>	Other Considerations (Explain on back of form if applicable.)

Service/Maintenance Technician(s) Signature: _____

J.F. Electric Management Signature: _____

Owner/GC Signature: _____

Safety/Engineering Rep. Signature: _____

Electrical Safety (Qualified)

The requirements contained in this section apply to employees who face a risk of electric shock when not taking the appropriate safety measures.

Protective Equipment Requirements

- Dielectric hard hat (Class E)
- AR clothing
- Rubber gloves with leather protectors
- Protective shields, barriers or insulating material
- Insulated tools and handling equipment
- Fuse handling equipment for the system voltage
- Safety glasses with side shields
- Appropriate rated hood/face shield

Additionally, employees who are considered unqualified but are covered by this section shall be trained in and be familiar with any electrically related safety practices not specifically addressed for their safety.

Qualified Persons

Qualified Persons (those permitted to work on or near exposed energized parts) shall at a minimum, be trained in and familiar with the following:

1. Skills and techniques to distinguish exposed energized parts from other parts of electrical equipment.
 - a) All electrical equipment is to be treated as energized until it has been locked and/or tagged out and checked by a Qualified Person.
 - b) All non-grounded metal parts and electrical insulators of electrical equipment are assumed energized until checked and locked and/or tagged out by a Qualified Person.
2. Skills and techniques to determine the nominal voltage of exposed energized parts
 - a) The nominal voltage of exposed energized parts shall be determined as follows:
 - i. All exposed energized parts shall be assumed to be at the maximum available voltage at the equipment.
 - ii. The exposed energized part's voltage shall be determined to be in one of the following categories by inspection of the equipment's insulation system and other factors, i.e. markings and warning signs.
 - A. over 15kv
 - B. 600 volts to 15kv
 - C. 50 volts to 600 volts
 - D. Less than 50 volts
 - iii. The actual voltage shall be determined using a voltmeter designed for the voltage level determined by step 2.

NOTE - ALL VOLTAGE MEASUREMENT ON EQUIPMENT OPERATING AT 50v OR MORE SHALL BE PERFORMED WEARING THE APPROVED PPE:

- A. Below 600 volts the appropriate voltage tester shall be used to check for voltage.
 - B. Above 600 volts a glow stick and tick-tracer shall be used to check for voltage. A check for voltages below 600 volts shall also be made if no voltages above 600 volts are found to ensure that there are no induced voltage hazards.
 - C. The voltages shall be checked line-to-line and line-to-ground on all electrical wiring leaving or entering the equipment.
 - D. All fuses shall be checked on both the supply and load side voltage
3. Is knowledgeable of the minimum approach distances.
 When a Qualified Person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, they shall not approach or take any conductive objects, without an approved insulating handle, closer to energized parts than shown in the table below, unless:
- a) The person is insulated from the energized part with rubber gloves, and rubber sleeves if necessary, rated for the voltage involved; or
 - b) The energized part is insulated both from all other conductive objects at a different potential and from the Qualified Person; or
 - c) The Qualified Person is insulated from all conductive objects at a potential different from that of the energized part.

Approach Distances for Qualified Person(s) (alternating current)

Voltage Range (phase-to-phase)	Minimum Approach Distance
300 Volts or Less	Avoid Contact
Over 300 Volts: Less than 750 Volts	1 ft. 0 inches
Over 750 Volts: Less than 2.0 kv	1 ft. 6 inches
Over 2.0 kv: Less than 15 kv	2 ft. 0 inches
Over 15 kv: Less than 37.0 kv	3 ft. 0 inches
Over 37.0 kv: Less than 87.5 kv	3 ft. 6 inches
Over 87.5 kv.: Less than 121 kv	4 ft. 0 inches
Over 121 kv.: Less than 140 kv	4 ft. 6 inches

- 4. Have completed an approved electrical apprentice training program.

General Safety Related Work Practices

Electrical parts to which an employee may be exposed SHALL be placed in an electrically safe work condition before working on or near them.

If de-energizing the parts introduces additional or increased hazards or is infeasible due to equipment design or operational limitations, the energized parts need not be de-energized.

This applies only to the following:

1. Interruption of life support equipment, deactivation of emergency alarm systems, shut down of hazard location ventilation equipment or removal of illumination for an area.
2. Infeasibility due to the equipment design or operational limitations, including testing of electrical circuits that can only be performed with the circuit energized, and work on circuits that form an integral part of a continuous industrial process that would otherwise need to be completely shut down in order to perform work on one circuit or piece of equipment.
3. If the exposed parts are not de-energized (for reasons of increased or additional hazards or infeasibility), other safety related work practices to protect against contact of energized circuit parts directly with any part of the body or indirectly through some other conductive object SHALL be used. The work practices used shall be suitable for the conditions under which the work is performed and for the voltage level of the exposed electric conductors or circuit parts. Note: Jurisdictional work rules regarding staffing and equipment requirements for work on energized equipment SHALL be followed.
4. Only Qualified Person(s) (those trained to distinguish exposed energized parts from other parts of electrical equipment, have the ability to determine the nominal voltage of the energized parts and whom are knowledgeable of the clearance and approach distance) can work on energized electrical equipment. These personnel shall be capable of working safely on energized circuits and shall be familiar with the proper use of precautionary techniques, personal protective equipment, insulating and shielding material and insulated tools.
5. If work is to be performed near overhead lines, the lines shall be de-energized and grounded or other protective measures shall be provided before work is started. If the lines are to be de-energized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to also ground them. If protective measures such as guarding, isolating or insulating are provided, these precautions shall prevent employees from contacting such lines directly with any part of their bodies or indirectly through conductive materials, tools or equipment.
6. When an unqualified person or persons (those not trained to distinguish exposed energized part from other parts of electrical equipment, to determine the nominal voltage of the energized parts and to determine safe working clearances and approach distances) work in an elevated position near overhead lines, the location shall be such that the person or persons and the longest conductive object the person may come into contact with cannot come closer to any unguarded, energized overhead line than the following distances:

- 20 ft. for voltages to ground below 50 kv
 - 20 ft. plus 4 inches for every 10 kv over 50 kv
7. Unqualified personnel working on the ground in the vicinity of overhead lines cannot bring any conductive object closer than 20 ft. from unguarded, energized overhead lines of voltage of 50 kv or less to ground, or closer than 20 ft. plus 4 inches for every 10 kv over 50 kv.
 8. Where flammable materials are present, electric equipment capable of igniting them shall not be used unless measures are taken to prevent hazardous conditions from developing. Such material includes but not limited to: flammable gases, vapors or liquids; combustible dust; and ignitable fibers or filings.

Working on or Near Exposed De-Energized Parts

1. The following applies to work on exposed de-energized parts or near enough to them to expose the employee to any electrical hazard the parts may present:
 - a) Conductors and parts of electric equipment that have been de-energized, but have not been locked out or tagged shall be treated as energized parts with all work procedures and precautions followed.
 - b) While any employee is exposed to contact with parts of fixed electrical equipment or circuit, which have been de-energized, the circuits energizing the parts shall be locked out or tagged or both in accordance with the Lockout/Tag out procedure.
2. De-energizing equipment
 - a) Safe procedures for de-energizing circuits and equipment shall be determined before circuits or equipment are de-energized.
 - b) The circuit and equipment to be worked on shall be disconnected from all electrical energy sources. Control circuit devices such as push buttons, selector switches and interlocks shall not be used as the sole means of de-energizing the circuits or equipment. Interlocks for electrical equipment shall not be used as a substitute for locking and tagging procedures. Always stand to one side of the switch cabinet when de-energizing circuits or equipment.
 - c) Stored electric energy which might endanger personnel shall be released. Capacitors shall be grounded and high capacitance elements shall be short-circuited and grounded if the stored energy might endanger personnel. (If the capacitors or associated equipment are handled while releasing energy, they SHALL be treated as energized and all procedures and precautions for handling energized equipment shall be followed).
 - d) Stored non-electrical energy in devices that could re-energize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not accidentally energize the device.
 - e) A lock and tag shall be placed on each disconnecting means used to de-energize circuits and equipment on which work is to be performed. The lock shall be attached so as to prevent personnel from operating the disconnecting means unless undue force is used.

- f) Each tag shall contain a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.
- g) If a lock cannot be applied and it can be demonstrated that tagging procedures provide a level of safety equivalent to that obtained by use of a lock, then a tag may be used without a lock. (A tag used without a lock shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by use of a lock. Example: Removal of an isolating circuit element; blocking of a controlling switch or opening an extra disconnecting device).
- h) Before working on de-energized circuits or equipment, an electrically Qualified Person shall operate the equipment or otherwise verify that the circuit or equipment cannot be re-energized or started. The electrically Qualified Person shall use test equipment to test the circuit elements and electrical parts of the equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back feed even though the specific parts of the circuit have been de-energized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately before and after the circuit is tested.

Re-Energizing Equipment

These requirements SHALL be met, in the order given before circuits or equipment are re-energized, even temporarily:

1. An electrically Qualified Person shall conduct the test and make visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds and other such devices have been removed, so that the circuit or equipment can be safely energized.
2. Employees exposed to the hazards associate with re-energizing the circuit or equipment shall be warned to stand clear of the circuit or equipment.
3. Each lock and tag shall be removed by the employee who applied it or under the employee's direct supervision. (If the employee is absent from the work place, the lock and tag may be removed by a Qualified Person after exhausting efforts to contact the person and after making a complete inspection (with the appropriate supervisors) to ensure the equipment is safe to re-energize. The employee shall be made aware that the tag and lock have been removed, upon their return to work.
4. Before re-energizing any circuits or equipment, there shall be a visual determination made to ensure that all employees are clear of the circuit or equipment.
5. When re-energizing circuits or equipment stand to one side of the cabinet when operating switches.

Working on or Near Energized Parts

These requirements SHALL be met, in order to work on exposed energized parts involving either direct contact or contact by means of tools or materials, and any work done near enough to exposed energized parts for employees to be exposed to any hazard they present

1. Only Qualified Person(s) shall work on electrical circuit parts or equipment that have not been de-energized. Such persons shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding material and insulated tools, and shall use these measures. This person is one who has completed the appropriate apprentice training and has been instructed in proper procedures and personal protective equipment to be used when dealing with energized circuits.
2. If work is to be performed near overhead lines, the lines shall be de-energized and grounded, or other protective measures shall be provided before work is started. (Refer to Approach Distances stated previously).
3. For voltage normally encountered with overhead power lines, objects which do not have an insulating rating for the voltage involved are considered to be conductive.

Working on Electrical Equipment 50 Volts or Less

These requirements cover the work on equipment and electrical systems operating under 50 volts.

1. Equipment and electrical systems operating at 50 volts or less shall be tested for actual voltage before work begins.
2. Employees working on equipment or systems operating 50 volts or less are not exposed to an electrical shock hazard.
3. Equipment and electrical systems operating at 50 volts or less shall be locked or tagged out if a hazard of a remote starting of the equipment exists.
4. If the power supply to equipment or electrical systems operating at 50 volts or less is greater than 1,000 volts-amps the equipment shall be treated as a potential burn hazard.

Vehicular and Mechanical Equipment

1. Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 feet is maintained. If the voltage is higher than 50 kv the clearance shall be increased by 4 inches for every 10 kv above 50kv.
2. If the vehicle is in transit with its structure lowered the clearance may be reduced to 4 ft. If the voltage is higher than 50 kv the clearance shall be increased by 4 inches for every 10 kv above 50 kv.
3. If insulating barriers are installed to prevent contact with the line, and if the barriers are rated for the voltage of the line being guarded and are not part of or an attachment of the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

4. If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a Qualified Person, the clearance between the insulated portion of the aerial lift and the power line may be reduced to the distance given previously.
5. Employees standing on the ground shall not contact the vehicle or mechanical equipment or any of the structure that provides a conductive path to the employee on the ground. Barricades and/or warning signs shall be used to prevent any such contact.
6. If any vehicle or mechanical equipment capable of having parts of its structure elevated near an energized overhead line is intentionally grounded, employees working on the ground near the point of grounding shall not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on the earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

Illumination of Electrical Working Area

1. Do not enter spaces containing exposed energized parts unless illumination is provided that enables you to perform work safely.
2. Where lack of illumination or an obstruction precludes observation of the work to be performed, do not perform task near exposed energized parts.
3. Do not reach blindly into areas which contain energized parts.

Confined Space Work

1. When working in a confined space that contains exposed energized parts, install and use protective shields, protective barriers or insulating material as necessary to prevent inadvertent contact with the energized parts.
2. Secure doors, hinged panels, etc. to prevent them from swinging into an employee and causing contact with exposed energized parts.

Conductive Materials and Equipment

1. Conductive materials and equipment that are in contact with any part of employee's body shall be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts.
2. If long dimensional conductive objects (such as conduit) must be handled in areas with exposed energized parts, precautions shall be taken to insulate or guard energized parts to minimize the hazard and use deliberate, slow material handling techniques while wearing rubber gloves.

Portable Ladders

Only portable fiberglass ladders meeting ANSI required Class 1A or greater (300 pound rating) shall be used.

Conductive Apparel

Conductive materials such as rings, bracelets, watches, watch bands, key chains, metalized aprons, and clothing with conductive thread shall not be worn when working on or near exposed energized parts.

Housekeeping Duties

1. Where energized parts present an electrical contact hazard, housekeeping duties shall not be performed until insulating equipment or barriers are installed to prevent contact when working close to the energized parts.
2. Electrically conductive cleaning materials shall not be used in proximity to energized parts unless insulating equipment or barriers have been installed. (Electrically conductive cleaning materials include: steel wool, metalized cloth and silicon carbide, as well as conductive liquid solutions).

Interlocks

1. Only a Qualified Person, taking special precautionary procedures, using personal protective equipment and insulating or shielding material and using insulated tools, shall be allowed to defeat an electrical safety interlock and then only temporarily while working on the equipment.
2. The interlock system shall be returned to its operable condition when the work is completed.

Use of and Handling of Portable Electric Equipment

Cord and plug connected equipment, including extension cords:

1. Portable equipment shall be handled in a manner which will not cause damage.
2. Flexible electric cords connected to equipment shall not be used to raise or lower the equipment.
3. Flexible cords shall not be fasten with staples or otherwise hung in such a fashion as could damage the outer jacket or insulation.
4. Visually inspect portable cord and plug connected equipment and flexible cord sets (extension cords) before any use for loose parts, deformed and missing pins, damage to outer jacket or insulation and for evidence of possible internal damage, such as, pinched or crushed outer jacket.
5. Cord and plug connected equipment and extension cords which remain connected once put in place and which are not exposed to damage need not be visually inspected again until relocated.
6. Cord and plug connected equipment or extension cords which show a defect or evidence of damage that might expose an employee to injury shall not be used.
7. Remove the defective material from service and tag it with a danger tag or discard the material. It shall not be re-used until repairs and testing renders it safe for re-use.
8. When attaching a plug to a receptacle, including extension cords, check first to make sure that both the plug and receptacle are of the same configurations.

9. Flexible cords used with grounding type equipment shall contain an equipment grounding conductor. Attachment plug and receptacles shall not be connected or altered in any manner that would prevent proper continuity of the equipment grounding conductor at the point where the plug is attached to the receptacle. These devices shall not be altered to allow the grounding prong of a plug to be inserted into slots intended for connection to the current carrying conductors.
10. Adapters which interrupt the continuity of the equipment grounding connection shall not be used.
11. Portable electric equipment and extension cords used in highly conductive work locations or in job locations where employees are likely to contact water or conductive liquids shall be approved for those locations. (Highly conductive work locations include those inundated with water or other conductive liquids).
12. Employee's hands shall be dry when plugging and unplugging flexible cords or cord and plug connected equipment, if the equipment is energized.
13. Energized plug and receptacle connections shall only be handled with insulating protective equipment, if the conditions of the connection could provide a conducting path to an employee's hand. (For example-a cord connector that is wet or covered with metallic dust).
14. Locking type connectors shall be properly secured after connection.

Electric Power and Lighting Circuits

Routine opening and closing of circuits

1. Only load rated switches, circuit breakers or other devices specifically designed as disconnecting means shall be used for the opening, reversing or closing of circuits under load conditions.
2. Cable connectors not of the load break type, fuse terminal lugs and cable splice connections shall not be used to open or close circuits, except in emergencies.
3. After a circuit is de-energized by a circuit protection device the circuit shall not be manually re-energized until it has been determined that the equipment and circuit can be safely energized.
4. Repetitive manual re-closing of a circuit breaker or re-energizing circuits through the replacement of fuses is prohibited.
5. When it can be determined from the design of the circuit and over-current device involved that the automatic operation of a device was caused by an overload rather than a fault condition, an examination of the circuit or connected equipment is unnecessary before re-energizing.
6. Over-current protection of circuits and conductors shall not be modified, even on a temporary basis beyond that allowed by the installation safety requirement for over-current protections.

Test Instrument and Equipment

1. Only Qualified Persons shall perform testing on electrical circuits or equipment.

2. Test instruments, equipment and all associated test leads, cables, power cords, probes and connectors shall be visually inspected for external defects and damage before the equipment is used.
3. Instruments found to be defective or damaged shall be removed from service and not used until repaired and tested to render the equipment safe.
4. Test instruments, equipment and their accessories shall be rated for the circuit and equipment to which they will be connected and SHALL be designed for the environment in which they will be used.
5. Test instruments shall be tested before and after use.

Use of Protective Equipment

1. Personal Protective Equipment
 - a) Employees working in the area where there are potential electrical hazards SHALL be provided with, and shall use, electrical protective equipment that is appropriate for the specific part of the body to be protected and for the work to be performed.
 - b) Protective equipment shall be maintained in a safe, reliable condition and shall be periodically inspected or tested for reliability.
 - c) If the insulating capability of protective equipment could be subject to damage during use, the insulating material shall be protected. Leather protectors SHALL be used to protect rubber gloves.
 - d) Employees shall wear non-conductive head protection.
2. General Protective Equipment and Tools
 - a) When working near exposed energized conductors or circuits, each employee shall use insulated tools or handling equipment, if the tools or equipment could make contact with the conductor or parts.
 - b) If the insulating capability of insulated tools or handling equipment is subject to damage, the insulating material shall be protected.
 - c) Fuse pulling equipment, insulated for the circuit voltage, shall be used to remove or install fuses when the fuse terminals are energized.
 - d) Ropes and hand lines used near exposed energized parts shall be non-conductive.
3. Protective Shields, Protective Barriers or Insulating Materials
 - a) Protective shields, protective barriers or insulating material shall be used to protect each employee from shock, burns or other electrical related injuries while employees are working on or near exposed energized parts which might be accidentally contacted or where dangerous electric heating or arcing might occur.
 - b) When normally enclosed energized parts are exposed for maintenance or repair, the parts shall be guarded to protect unqualified persons from contact with the energized parts.
 - c) Unqualified persons shall be kept a minimum of 10 feet away from energized parts while Qualified Persons perform work on the parts. The area shall be

barricaded to prevent unqualified persons from getting closer than 10 feet from the work.

4. Alerting Techniques

Safety signs, safety symbols or accident prevention tags shall be used where necessary to warn employees about electrical hazards which may endanger them and to protect employees from shock, burns or failure of the electrical equipment.

5. Barricades

- a) Barricades shall be used in connection with safety signs where it is necessary to prevent or limit employee access to work areas which could expose them to un-insulated energized conductors or circuit parts. Conductive barricades shall not be used where they might cause an electrical contact hazard.

6. Attendants

- a) If signs or barricades are not sufficient warning, an attendant shall be stationed to warn and protect employees.

Tower Safety

Fall Protection

1. General

- a) 100% fall protection, compatible with the tasks assigned shall be provided, used and maintained in accordance with this program when personnel are exposed to falls in excess of 4 feet.
- b) Climbing restriction – All climbing will cease when:
 - Ground temperatures are at or above 100 degrees F or at or below -15 degrees F.
 - When sustained winds are 30 mph or higher, all climbing will cease until winds are down to an acceptable level.
 - Anytime the presence of ice on the tower to be climbed.
- c) Free Climbing is strictly prohibited.
- d) Where more than one qualified climber is present, the second climber shall not start to climb until the first climber has reached the working height.

2. Planning

All projects requiring climbing shall be planned by a competent person. Pre-job planning shall include identification of primary and alternate climbing routes, evaluation of obstructions, qualifications/training of climbers, personal fall arrest system (PFAS), and any other factors associated with climber activities.

3. Fall Protection System Evaluation

On an ongoing basis, the competent person shall evaluate work operations, climbing facilities, weather conditions, and PFAS to determine if any modifications to the pre-job plan are required.

4. Inspection

- a) PFAS shall be inspected prior to use, quarterly and annually by a trained employee.
- b) Prior to use inspection. The prior to use inspection is a screening inspection to ensure the equipment is ready for use. Inspect the equipment for wear, damage, defects, and deterioration. Do not use any piece of equipment that fails inspection. Documentation of this inspection is not required.
- c) Quarterly and Annual Inspection. The quarterly and annual inspection is a comprehensive inspection of the fall protection equipment. The inspector shall follow and document the inspection on the company fall protection inspection checklist.

5. Training/Qualifications

Before performing work at heights above 4 feet, employees shall complete Competent Climber/Rescue training through an approved vendor.

6. Personal Fall Arrest System

- a) Employees shall pre plan their climbing activities to insure they have the proper PFAS components to perform the job safely.
- b) PFAS requires at least a full-body harness with shock absorbing lanyards or retractable lifeline and an anchorage point rated at 5000 lbs. per employee attached.
- c) Positioning devices shall not be used in place of a fall arrest system and shall be considered "Free Climbing". Free climbing is strictly prohibited.
 - Whenever possible, an overhead anchorage point shall be selected to reduce the contact hazard and forces associated with a fall.
 - All safety lines and lanyards shall be protected against being cut or abraded.
 - When vertical lifelines (drop lines) are used, no more than one employee shall be attached to any one lifeline. Lines used with rope grabs shall be a minimum of 5/8-inch diameter.

7. Body Harness (Full)

- a) A personal fall arrest system shall include a full-body harness that is properly fitted to the employee and utilized to manufacturer's specifications.
- b) The use of a body belt is prohibited as an approved PFAS.
- c) Prior to accessing towers or rooftops, employees shall conduct an inspection of PPE, and complete the PFAS equipment checklist form. The completed forms shall remain accessible and at the job site at all times. During inspection, damaged PPE shall be removed from service immediately.

8. Connecting Devices

- a) A twin shock-absorbing lanyard shall be utilized to attach from the full-body harness to an approved anchor or connection point.

- b) The attachment point of the lanyard to the body harness shall be to the D-ring in the center of the wear's back.
- c) Snap hooks shall be double self-locking type and shall not be connected to each other.
- d) Connection devices, including carabiners, cross-arm straps, self-retractable lifelines, snap hooks, cable/rope grab, lanyards, etc., shall be utilized to manufacturer's specifications.

Tower Rescue

The following requirements identify the steps to be taken when providing emergency assistance for rescue and/or removal of an injured employee from an elevated workstation:

- a) All employees and subcontractors that will be working on towers or rooftops shall be certified in Tower Safety and Rescue from an approved NATE CTS Vendor.
- b) Prior to work, the tower crew shall hold a job briefing to discuss the plan for rescue, in addition to job hazards and scope of work.
- c) To ensure all hazards, control measures, and rescue information is communicated to each employee, the crew shall conduct a Pre-Work Assessment survey that include:
 - Rescue method and equipment to be used.
 - Location of rescue equipment and first-aid kits shall be at the base of the tower structure;
 - Longitude and latitude numbers of site
 - Directions and map to site
 - All emergency numbers and contact numbers
- d) The use of capstan hoist for rescue is strictly prohibited.
- e) In the event of a medical emergency, emergency personnel shall be notified prior to conducting personnel roles, and initiate rescue.
- f) Lead person on site shall obtain all rescue equipment, determine/assign additional rescue personnel roles, and initiate rescue.
- g) The rescuer shall rig a controlled descent repel lifeline above the injured employee as close as possible to the injured employee.
- h) The rescuer shall connect their descending device to the repel line and ascend into position to connect to the victim.
- i) The rescuer shall then attach a pickoff strap to the injured employee's back D-ring. The strap shall then be attached to the controlled descent device (not to the rescuer's harness).
- j) Utilizing the haul system, the rescuer shall raise the injured employee enough to disengage the employee's fall arrest lanyard or suspension device.
- k) The rescuer shall then remove the injured employee from his fall arrest or suspension device, remove the haul system and lower the employee safely to the ground.

- l) First aid shall be administered to the injured employee by a first-aid/CPR-trained person until the local emergency medical team arrives.
- m) Contact the Safety Representative as soon as possible.
- n) The site and all equipment shall be secured until a proper accident investigation can be performed.

RF/EME Safety

All personnel entering a work site that is demarcated as a yellow or red zone shall have EME/RF awareness training.

1. **Maximum Permissible Exposure (MPE)** – The Maximum Permissible Exposure (MPE) is a maximum level of exposure that is specified by the FCC. The MPE is based on frequency. The Occupational/Controlled MPE applies in areas where exposure is related to employment duties. The General Population/Uncontrolled MPE applies to persons assumed to have no knowledge of or control over their potential exposure to EME energy.
 2. **Electromagnetic Energy (EME) / Radio Frequency Energy (RF)** – RF is a form of EME used for transmitting radio signals, EME/RF is a type of non-ionizing radiation. Other examples of non-ionizing radiation include laser, radar, microwaves, UHF/VHF AM broadcast, paging systems, and infrared. Damage to the body from EME/RF overexposure is dependent upon time, distance, and shielding from the EME/RF source.
 3. **Time – averaging** – Maximum Permissible Exposures are expressed as time-averaged exposures (typically 6-minutes for Occupation/Controlled MPE). The use of time averaging to regulate total exposure allows an individual to work in an area with higher energy levels for shorter durations.
 4. **General Work Practices:**
 - a) Assume all antennas are active.
 - b) Before working on antennas, notify owners and disable appropriate transmitters. Work on a specific antenna shall only be accomplished after the attached transmitters have been turned off. This shall be attempted only after contacting the owners or operators. Coordination will help ensure that turning off the equipment will not cause serious disruption of the service.
 - c) Maintain safe clearance from all antennas. A small increase in distance from an antenna can have a substantial effect on reducing the EME exposure.
 - d) Do not stop in front of antennas.
 - e) When climbing a tower, employees shall select rest points away from antennas. They shall always try to keep below or behind antennas to minimize their exposure to the main beam of the antenna.
 - f) Use personal EME monitors while working near antennas. When multiple employees are working at an EME site, the “highest risk” employee (the one who will be working closest to the antennas) shall be the one wearing the monitor.
-

- g) Never operate transmitters without shields during normal operation.
- h) Do not operate base station antennas inside equipment rooms. Using antennas inside equipment rooms can increase the exposure to EME levels above FCC guidelines and create undesirable radio frequency interference.
- i) Antenna sites shall have physical access control. This is accomplished by fencing around the compound.
- j) When other transmitters are involved, power reduction, lock-out/tag-out, or other control procedures may be necessary.

5. Electromagnetic Energy Site Signage

The Federal Communication Commission (FCC) has developed guidance for EME/RF site signage through use of Zones (Blue, Yellow and Red). To comply with FCC site signage requirements, radio tower and rooftop sites shall be posted in accordance with the following:

- a) **Blue Zone (Notice)** – The blue zone is an area where the time-weighted exposure is below 20% of the Occupational/Controlled MPE. There is no time limit or special work practices required for this zone and only basic EME awareness is needed.
- b) **Yellow Zone (Caution)** – The yellow zone is any area where the time-weighted exposure is between 20% - 100% of the Occupational/Controlled MPE. In this zone, the energy fields are within acceptable exposure limits, however areas adjacent may exceed acceptable limits. Only personnel with the appropriate training, knowledge, and understanding of EME procedures shall work in this area.
- c) **Red Zone (Warning)** – The red zone is any area where the time-weighted exposure levels are above 100% of Occupational/Controlled MPE. Areas determined to require red zone classification required special procedures, engineering controls, and restricted access. Examples of the procedures that may be implemented include:
 - Restricted site access,
 - Lockout/Tagout of transmitter equipment during maintenance,
 - Re-engineering site to reduce EME fields; or
 - Control of antenna types used on the site.

6. Extreme Temperatures

Heat Stress – Working in hot environments can cause several different types of health problems. The symptoms and recommended treatment measures are outlined below.

- a) **Heat Rash** – Reddened, sensitive rash, usually located under arms, between legs, shirt, and underwear at med-shift.
- b) **Heat Exhaustion** – Increased pulse, flushed or reddened complexion, slightly elevated body temperature, profuse sweating, nausea, light-headedness.

- Treatment of Heat Exhaustion – Rest in a cool, shaded area, replenish fluids and electrolytes, do not return to work until pulse and temperature return to normal and nausea subsides.
- c) Heat Stroke – Reddened complexion, absence of perspiration, elevated body temperature (above 105 degrees F), nausea, and unconsciousness.
 - Treatment of Heat Stroke – Move victim to cool shaded area, remove any PPE or heavy clothing, douse victim with cool water, force liquids if conscious, notify emergency medical services.

NOTE: THESE RESPONSES MUST BE IMPLEMENTED IMMEDIATELY. HEAT STROKE IS A LIFE-THREATENING CONDITION.

- d) Heat Stress Prevention – The elements of this section shall be implemented when the ambient temperature reaches 80 degrees Fahrenheit. These elements are designed to minimize the potential for heat-related health complications. While these efforts have proven to be beneficial, their implementation cannot guarantee that workers will not suffer from heat stress.
 - Fluid Replenishment
 - An ample supply of potable water shall be provided at the work site.
 - Water shall be maintained at a cool temperature.
 - Workers shall be encouraged to consume between 8 – 16 ounces of water at every break.
 - Breaks
 - Breaks shall be taken at regular intervals. As temperatures increase, the number of breaks should increase also.
 - Employees shall take breaks if they exhibit any of the symptoms of heat stress.
 - Miscellaneous Preventive Techniques
 - Wetting shirts or headbands may provide relief in very high temperatures.
 - Employees shall be advised to minimize or eliminate the use of alcoholic beverages during off-hours due to the diuretic effects of alcohol.

Cold Stress - This section addresses the hazards and control measures associated with performing work in cold conditions. The potential for cold stress is measured by a combination of ambient temperature, air movement, and the type of work being performed. The two primary types of cold stress are hypothermia and frostbite.

- a) Hypothermia – Shivering, pain in extremities, reduced mental alertness, core body temperature below 96.8 degrees F
 - Hypothermia Treatment – Move the victim to a warm area, remove any wet or damp clothing, and provide warm liquids that do not contain caffeine.
- b) Frostbite – Numbness or tingling of extremities (fingers, toes, ears, nose), discoloration of extremities due to formation of ice crystals under the skin.

- Frostbite Treatment – Move victim to a warm area, warm affected extremities by direct exposure to warming device or immersion in warm water.

NOTE: DO NOT APPLY FORCEFUL PRESSURE TO AREAS THAT HAVE BECOME DISCOLORED.

- Cold Stress Prevention – the following controls shall be implemented when ambient or equivalent chill temperature (ECT) temperature reaches the identified levels:
 - Below 40 degrees Fahrenheit
 - Employees should wear layered clothing appropriate for the level of cold and physical activity.
 - If working in windy and/or damp conditions, the outer layer of clothing should be designed to resist wind and/or be impermeable to moisture
 - Gloves shall be worn.
 - ECT below 20 degrees Fahrenheit
 - At the onset of shivering, minor frostbite, drowsiness or euphoria, employees should immediately get inside a warm truck cab.
 - Upon entering the truck, the outer layer of clothing should be removed and inner layers should be loosened to permit sweat evaporation.
 - ECT below 10 degrees Fahrenheit
 - Employees shall be under constant observation (Buddy System or Supervisor)
 - Work rate should not be as high as to cause heavy sweating
 - Sitting or standing still should be minimized

Employee Education and Training – All employees shall receive instruction designed to increase their awareness and understanding of the hazards of performing work in temperature extremes. The contents of this program shall be explained to all workers prior to engaging in work performed under temperature extremes.

7. Travel Policy

- a) Prior to departure, a pre-departure checklist shall be filled out and signed.
- b) Travel time shall be limited to no more than 12 hours of combined work and drive time. In addition, all travel will cease 4 hours after sunset.
- c) Travel shall not exceed 4 hours between stops.