IB ABEL INC
Electrical & Communication Contractor • Electrical Engineering
Connecting Your Business With Success

SAFETY MANUAL

188 pages
The program requirements of this manual are based on the potential safety hazards, and operating losses to which the company had a foreseeable exposure on the date of publication of this manual. Due to the constantly changing nature of government regulations, it is impossible to guarantee absolute accuracy of the material contained herein. Periodically, material in this manual will be updated, revised or supplemented in order to keep the manual current and relevant.

It is impossible to effectively deal with all safety concerns or procedures in a single manual. Many safety-related matters involve situation-specific factors, which are difficult to anticipate. Accordingly, this manual is not the definitive statement, or the only statement, on company safety concerns or procedures. This manual is a starting point and a good-faith attempt to create a viable, company-wide, safety program and philosophy. Although the information and recommendations contained in this publication have been compiled from sources believed to be reliable, the company makes no guarantee as to, and assumes no responsibility for, the correctness, sufficiency or completeness of such information or recommendations.

I. B. Abel, Inc. Copyright 2008
Table of Contents

Administrative:

Policy Statement on Safety 1
Employee Responsibility 2
Training and Education 3
Incident Reporting and Investigation 4
Transitional Duty Program 5
Drug and Alcohol Testing Policy 6
Corrective Action/Disciplinary Action Policy 7

Hazard Control:

Concrete and Masonry 8
Confined Spaces 9
Cranes and Rigging 10
Cutting and Welding 11
Driver Safety 12
Electrical 13
Emergency Action Plans (EAP) 14
Excavation 15

   Appendix A: Sloping and Benching Diagrams 15-4
   Appendix B: PA One Call 15-10
Fall Protection 16
Fire Prevention 17
Hand Tools 18
Heavy Equipment 19
Housekeeping/Material Storage 20
Lock Out/Tag Out 21
Mine Safety 22
OSHA, MOSH, MSHA Inspections 23
Outside Electrical Safety 24
Personal Protective Equipment (PPE) 25
Radiofrequency (RF) 26
Railway Safety 27
Scaffolds 28
Stairs and Ladders 29
Steel Erection 30
Tower Climbing and Erection 31
Work Zone Safety 32

**Occupational Health**

Asbestos Containing Materials 33
Back Injury Prevention 34
Blood Born Pathogens 35
Carbon Monoxide (CO) 36
Hazard Communication (HAZCOM) 37
Hearing Loss Prevention 38
Lead 39
Respiratory Protection 40
Silica 41
Smoking 42
Temperature Extremes 43
I. B. Abel considers the safety and health of our employees one our highest priorities. No other single endeavor is more vital to the successful pursuit of mutual goals and objectives. It is the intent of the company to provide a safe and healthy work environment for all employees and assure that they have the knowledge, skills and equipment to perform their jobs safely.

We will maintain a safety program conforming to the best practices for this industry. To be successful, such a program must embody proper attitudes toward injury and illness prevention on the part of all supervisors and employees. It also requires cooperation in all safety matters, not only between supervisor and employee but also between each employee and his/her co-workers. Only through such a cooperative effort can this safety program be in the best interest to all.

This safety program has the complete endorsement and backing of the upper management of this company. At I. B. Abel, Inc. we recognize, as a core value, the safety and health of our employees.

Our objective is a safety program that will reduce the number of injuries and illnesses to an absolute minimum. “Our goal is zero accidents and injuries”. The benefits of working together to meet this goal will be reflected upon our company, our customers and, most importantly the health and safety of our employees.

Patrick A Kinsley, President
I. B. Abel, Inc.
RESPONSIBILITIES FOR SAFETY

I. All Employees:
   A. Report any unsafe working condition to immediate supervisor.
   B. Keep individual work area in a clean, orderly and safe condition.
   C. Report ALL incidents to supervisor immediately. Cooperate with any necessary incident investigation.
   D. Treat with an approved panel physician for any work-related injury or illness requiring medical attention. Follow any work restrictions prescribed by the treating physician (see Transitional Duty Program in this section).
   E. Follow all safety and health rules.
   F. When in doubt – ask your supervisor
   G. Maintain a positive attitude toward safety and cooperate fully to ensure a safe, healthful workplace for all employees.

II. Supervisors
   A. Act as the “Competent Person” as defined by OSHA.
      1. Competent Person – one who is capable of identifying existing and predictable hazards in the surrounding or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authority to take prompt corrective action.
   B. Set a positive example by following all safety and health rules.
   C. Responsible for ensuring the safety of all employees under their management.
   D. Responsible for on-the-job training for safe work practices and safety regulations.
   E. Correct all unsafe working conditions immediately upon discovery.
   F. Conduct frequent and regular inspections of the job site to identify hazardous conditions.
   G. Investigate any reported incident immediately and complete the appropriate Incident Report form and turn in within 24 hours. Notify the Safety Department immediately of any
injury accidents or significant property, equipment or utility
damage (likely to exceed one-thousand dollars).

H. Accommodate work restrictions of injured/ill employees
assigned to the Transitional Duty Program. Supervisors must
make sure employees working under doctor-ordered work
restrictions do not exceed their restrictions.

I. Enforce all safety and health rules with a positive attitude and
stress the importance of working safely.

J. Issue Corrective Action Notices as necessary to discipline
employees in non-compliance with safety and health rules.

III. Safety Committee
   A. Conduct monthly meeting to discuss incidents, inspections
      and any other safety or health issues.
   B. Perform monthly job site inspections to ensure compliance
      with all safety and health rules.
   C. Advise the Safety Committee on policy or program additions
      or changes.

IV. Safety Department
   A. Coordinate all aspects of the Safety Program
   B. Conduct incident investigations to identify root causes and
      initiate corrective actions to prevent recurrence
   C. Inspect job sites to ensure compliance with all safety and
      health rules.
   D. Ensure compliance with all federal, state and local
      regulations.
   E. Act as a resource to all levels of the company regarding
      matters of worker safety and health

V. Management
   A. Actively support and participate in the company safety
      program.
   B. Ensure adequate training and education programs are in place
      for all levels of employees.
   C. Set a positive example by following all safety and health
      rules while on job sites.
SAFETY TRAINING AND EDUCATION

I. The following courses are offered throughout the year for employees of IB Abel, Inc.
   A. New Hire Orientation. All field employees receive a new hire orientation and receive a copy of the Safety Handbook.
   B. OSHA 10 Hour Construction Safety and Health Course. The 10 Hour course covers the following topics:
      1. Information about OSHA
         a) General Duty Clause and General Safety and Health Requirements
         b) Competent Person requirements
      2. Personal Protective Equipment and Respiratory Protective Equipment
      3. Fall Protection
         a) Fall protection requirements
         b) Fall protection systems criteria
      4. Electrical Hazards
         a) Requirements of OSHA's Subpart K
         b) Safety around power lines
         c) Lockout/Tagout
      5. Excavation
      6. Scaffolds
      7. Hazard Communication
         a) Material Safety Data Sheets
         b) Container Labeling methods
         c) Common hazardous materials used in construction and protective measures
      8. Stairways and Ladders
      9. Permit Required Confined Spaces
   10. Fire Protection and Prevention
   C. Weekly “Toolbox Talks”. Toolbox talks are conducted weekly by each field supervisor. Toolbox talks are held to discuss the following:
      1. The topic provided by the Safety Department including any discussion questions,
2. Upcoming work on the project and any potential safety or health hazards and their control measures,
3. The results of any safety inspections or incident investigations conducted within the previous week.
D. American Red Cross First Aid and CPR.
E. NFPA 70E. Standard for Electrical Safety in the Workplace. Training for all employees working on or near energized electrical equipment.
F. National Safety Council Defensive Driving. All drivers of company owned vehicles attend a defensive driving course based on the National Safety Council curriculum.
G. Commercial Motor Vehicle Driver Training. CDL drivers attend additional driver training in addition to the National Safety Council course. The course focuses on DOT compliance in addition to the safety hazards inherent in operating larger vehicles.
H. Equipment Operator Training. Heavy Equipment operators attend various levels of equipment operator training with an emphasis on safety.
I. Aerial Lift Training. Employees are trained and certified on the use of scissor type and boom type aerial lifts.
J. Forklift Training. Forklift operators are trained and certified on rough terrain and industrial fork lifts.
K. MSHA Part 46 Training. Employees required to work on mine properties receive training required by MSHA's Part 46 and be kept current.
L. Competent Person Training. Specialized courses are offered for trenching and excavation and scaffolding competent persons.
M. HAZWOPER. Employees working on uncontrolled hazardous waste sites will attend an appropriate Hazardous Waste Operations and Emergency Response course.
N. Powder Actuated Tools. Operators of powder actuated tools (Hilti, Ramset guns) will receive training and certification from an authorized provider.
INCIDENT REPORTING AND INVESTIGATION

I. All loss incidents (accidents) are to be investigated by the appropriate individual(s) as soon as possible after the incident occurs.
   A. Loss incidents that are to be investigated and reported include:
      1. Injuries or illnesses
      2. Property damage
      3. Equipment damage including company vehicles
      4. Utility damage
      5. Near misses (any event that could reasonably be expected to result in one of the above)

II. Incident Report
   A. The Incident Report is to be filled out by the immediate supervisor of the individual(s) involved in the incident.
   B. Reports are to be turned in no later than 24 hours following the incident.
   C. All injuries, all illnesses and any damage likely to exceed one-thousand dollars in cost must be phoned in to the Safety Department as soon as possible.
   D. After an appropriate investigation, the form must be filled out completely front and back. Any sections or spaces that are not applicable should be marked as N/A.
   E. The supervisor’s investigation should answer at a minimum, the following questions:
      1. WHO - everybody that was involved in the incident
      2. WHAT – exactly what happened
      3. WHERE – where did the incident occur
      4. HOW – what caused the incident
      5. WHEN – when did the incident occur
      6. WHY-WHY-WHY – what actions or conditions led to the incident, why did those actions or conditions occur, and why were those actions or conditions not prevented.
   F. What immediate measures have been taken to prevent recurrence?
   G. What permanent corrective actions are recommended?

III. Vehicle Incident. See Section 13 – Emergency Action Plans for further information on vehicle incidents.
A. Contact the police if there are any injuries, property damage, or either vehicle is not driveable. Also contact the police if there is any question as to fault.
B. Contact the Safety Department.
C. Provide your name, vehicle registration, insurance and company information to the other parties involved.
D. Fill out a Vehicle Incident Form. These should be in the glove compartment of every company vehicle. Fill out the form completely including the names, addresses and phone numbers of all parties involved, as well as vehicle and insurance information.
E. Get names and phone numbers of any witnesses to the incident.
F. Take pictures of the incident. Include pictures of damage to any vehicles, property damage, and a picture of the scene (if this can be done safely).

A. Refer to the One Call ticket for information needed on the Underground Utility Damage Report
B. Take photographs to attach to the report. Photograph the damaged line, any utility markings (or lack of markings), the distance between the markings and the line, and any other pertinent site conditions.
C. Complete the report, attach a copy of the One Call ticket, and any photographs, and turn them in to the Safety Department within 24 hours.

V. Post Incident Drug and Alcohol Testing
A. Any employee involved in an incident is subject to the testing requirements outlined in the I. B. Abel. Inc. Substance Abuse Testing Policy.
I. Scope. Employees sustaining work-related injuries or illnesses requiring temporary physical limitations will be accommodated with work through the Transitional Duty Program.

II. Benefits of the Transitional Duty Program.
   A. Speeds up an employees return to normal job assignment
   B. Keeps injured/ill employees productive.
   C. Employees earn their normal wage during the transitional period.
   D. Lowers insurance costs, making the company more profitable

III. Definitions.
   A. Transitional Duty. Temporary work performed during the time period between a work-related injury/illness and the time that a full release is obtained from the treating physician. Transitional Duty is also referred to as light duty or return-to-work duty.
   B. Transitional Duty Team. The Transitional Team consists of the injured/ill employee, the employee’s Division Manager, the employee’s immediate supervisor, the Workers Compensation Coordinator, and members of the Safety Department as necessary.
   C. Work Restrictions. A set of parameters assigned by the treating physician to limit further injury or illness to an employee involved in a work-related incident. Examples of work restrictions include “No lifting more than 25 pounds”, or “No operating heavy equipment”.
   D. Panel Physician. A designated health care provider approved for work-related injuries and illnesses. Panel Physicians are listed in the Workers Compensation Program. All supervisors should have a complete list.

IV. Procedures.
A. Employees must immediately notify their supervisor of any work-related injury or illness. Incidents are to be reported as required by this section – *Incident Reporting and Investigation*

B. The supervisor will instruct the employee that if medical attention is necessary, they must treat with a panel physician. Transportation will be arranged if necessary.

C. After an examination, and any necessary treatment, the treating physician will assign work restrictions. Work restrictions will be reviewed with the employee by the panel physician. A copy of the work restrictions will be faxed to the Workers Compensation Coordinator.

D. Injured or ill employees are responsible for reporting to the Workers Compensation Coordinator with their work restrictions at or before the start of the next work shift. **The Workers Compensation Coordinator is Chris Linebaugh, ph. 717 845-1639; fax 717 843-5614.**

E. Members of the Transitional Duty Team will be notified of the injured/ill employee’s restrictions and transitional duty options will be considered.

V. Transitional Duty Options. Upon receiving work restrictions, the Transitional Duty Team will determine what is the best option for Transitional Duty for the injured/ill employee.

A. Return to original job assignment. If possible, the injured/ill employee will return to their normal work assignment modified to fit their restrictions.

B. Return to Division. Transitional work within the employee’s division is the next option. If an injured/ill employee cannot return to their normal job assignment, work will be sought elsewhere within that employee’s division.

C. General Light Duty Work. If the injured/ill employee cannot be accommodated at their regularly scheduled job, or within their division, general Light Duty work will be assigned. Light Duty work may involve clerical work such
as filing reports; painting in and around the yard area; cleaning, etc.

VI. Miscellaneous.
A. Transitional duty will be limited to an eight hour workday, Monday through Friday, unless the treating physician’s work restrictions are more restrictive.
B. Employees assigned to transitional duty will receive their normal rate of pay.
C. Restrictions and transitional duty work options will be re-evaluated after every follow-up doctor appointment.
D. Transitional Duty is only available for employees with temporary restrictions. Transitional Duty will not be used for employees with permanent work restrictions.
Substance Abuse

IB Abel, Inc. has made a strong commitment to provide all of its employees with a safe working environment. In order to fulfill this commitment, IB Abel requires that every employee report to work in a condition that will allow him/her to be physically and mentally alert and enable the safe performance of the job. Working while under the influence of drugs or alcohol or using or possessing these substances on company premises or on working time is not in keeping with this objective. IB Abel, therefore, is implementing a policy to address the issue of drug or alcohol abuse in the workplace.

IB Abel recognizes that alcoholism and drug addiction are medical and behavioral problems that can affect anyone, including IB Abel employees. Substance abuse can significantly hinder a worker’s job performance, resulting in reduced quality of work and output, impaired decision making, increased accidents and safety problems and absenteeism and tardiness. Therefore, to help ensure a safe and healthful work environment for our employees, IB Abel will work to create and maintain a workplace free of inappropriate alcohol and drug use.

This policy applies to all current employees and applicants for employment at IB Abel within the United States. Employees who are covered by mandatory federal programs (i.e. Department of Transportation) will be subject to the regulations of the mandatory program as well as IB Abel’s policy.

Our efforts encompass the following approaches:

- **Prevention**: Using education and drug testing of prospective employees to prevent the occurrence or spread of alcohol and drug abuse among employees,
• **Rehabilitation:** Seeking to identify and offering the opportunity to rehabilitate those employees who are addicted to or dependent upon alcohol or drugs, and

• **Enforcement:** Taking a strong stand against the unauthorized possession, use or sale of alcohol or drugs in the workplace by enforcing IB Abel corrective action policies and involving appropriate legal authorities.

I. **EDUCATION**

IB Abel will provide employees and their families with information about the dangers of substance abuse, its impact on home and work life, the Company’s substance abuse policy, the counseling and rehabilitation services the Company makes available to employees and the workplace penalties that may be imposed on individuals who fail to successfully deal with their substance abuse problems.

II. **SELF-IDENTIFICATION**

A. The key to successful intervention and treatment of substance abuse is early and voluntary efforts to seek help. IB Abel encourages employees who are addicted to or dependent upon alcohol or drugs to voluntarily seek assistance before problems arise on the job or at home. The resources of our Employee Assistance Program (EAP) are available to help employees who self-identify.

B. Substance abuse is a treatable illness. IB Abel is concerned for the welfare of any individual who is addicted to or dependent upon alcohol or drugs, and is committed to providing opportunities to help employees with a substance abuse problem to correct the problem and to achieve a meaningful and productive life at work, at home and in the community.

C. Substance abuse is not easily resolved by personal effort and may require professional assistance and treatment. With that in mind, IB Abel provides its
employees with the assistance of our EAP and other resources to assist in the evaluation and treatment of substance abuse.

III. **SUBSTANCE ABUSE TESTING**

All employees will be subject to drug and alcohol testing regardless of whether or not they are covered by our Department of Transportation Drug Testing Program. IB Abel will conduct drug and/or alcohol testing under the following circumstances:

A. **Pre-Employment Screening**

1. IB Abel will not employ a person who fails a pre-employment drug or alcohol screen.

2. All job applicants will be informed at time of application of the Company’s substance abuse policy and informed that any offer of employment will be conditioned on successful completion of a pre-employment drug and alcohol test.

3. Pre-employment drug and alcohol testing will be carried out in accordance with the drug testing and alcohol testing procedures.

4. In the event that the results of an applicant’s initial drug or alcohol test are positive, additional confirmation testing will be performed. If a positive test is confirmed, the Human Resources Department will be notified and the offer of employment will be revoked.

5. Should an applicant elect not to undergo a pre-employment drug or alcohol test or if the applicant’s confirmed test is positive, he/she will be ineligible for employment based upon failure to satisfactorily complete the pre-employment drug or alcohol test.

6. No job offer will be considered final and no employee may begin working until negative drug and alcohol test results have been received.
B. Post-Incident Testing

1. When a driver employee is in an incident where 1) a human fatality is involved, 2) the driver has been issued a citation and bodily injury with immediate medical treatment away from the scene has occurred as a result of the incident, or 3) the driver has been issued a citation and disabling damage to any motor vehicle requiring tow-away has occurred as a result of the incident, the driver must submit to a drug and alcohol test.

2. Following any incident, the driver must contact the Company as soon as possible, in accordance with information set forth on the information card issued to the driver. The driver shall follow the instructions on the information card, as well as any other instructions given by Company representatives.

3. When any other employee is involved in a worksite incident which 1) requires the employee or another to receive professional care at an off-site medical facility, or 2) results in property damage or lost time, all employees involved must submit to a drug and alcohol test.

4. Post-incident testing will be performed as soon as possible after an incident. In the event that federal, state, or local officials, following an incident, conduct breath or blood tests for the use of alcohol and/or urine tests for the use of drugs, these tests will be considered to meet the requirements of this policy. In such instances, the employee must allow the Company to obtain the test results.

5. In the event that an employee is so seriously injured that he/she cannot provide a specimen at the time of the incident, the employee must
provide necessary authorization to the Company to obtain hospital records or other documents that may indicate whether drugs or alcohol were present in the employee’s system at the time of the incident.

C. **“Reasonable Cause” or Fitness for Duty Testing**

If Management suspects that an employee may be working under the influence of alcohol or drugs, he/she should refer the employee to Occupational Health Services for reasonable cause substance abuse testing and/or a Fitness-for-Duty Evaluation. The suspicion should be based on objective observations, the employee’s job performance or personal conduct at work.

D. **Random Testing**

1. Random testing of non-CDL employees will only be conducted as provided for in the most recent labor agreement.

2. Random selection shall be conducted throughout the year. To ensure compliance with Department of Transportation regulations, a separate random selection will be conducted for drivers. The Company will drug test, at a minimum, 50% of the average number of drivers in each calendar year. The Company will select, at a minimum, 25% of drivers for random alcohol testing. The minimum annual percentage rates for random drug and alcohol testing for drivers are subject to change pursuant to regulations issued by the Federal Motor Carrier Safety Administration.

3. Random selection, by its very nature, may result in employees being tested in successive random selections or more than once a calendar year. Alternatively, some employees may not be selected in a calendar year.
4. Individuals selected for random testing will be notified by the Company. If a randomly selected individual engages in conduct that does not lead to a collection, such conduct may be considered a refusal to test.

IV. TESTING PROCEDURES

Prior to testing, an applicant or employee will be required to sign an Employee Consent and Release Statement. An employee’s refusal to sign the form or to submit to testing will subject the employee to disciplinary action. An applicant’s refusal to sign the form or to submit to testing will disqualify the applicant from further consideration for employment.

A. Drug Testing

1. The substances to be tested for are marijuana, cocaine, opiate metabolites, phencyclidine and amphetamines. Additional substances may be tested for if job construction specifications require it.

2. If an individual cannot provide a sufficient urine specimen, he/she will be evaluated by a physician of the Company’s choice. If the physician cannot find a legitimate medical explanation for the inability to provide a specimen, the individual will be considered to have refused to test.

3. All initial positive drug screens must be confirmed at the laboratory by a gas chromatography/mass spectrometry (GC/MS) test before the test result will be considered positive. A drug test will be considered positive if the reported result for any substance exceeds the permissible cut-off level for that substance.

4. If the confirmed test result is positive, the employee will be contacted by a Medical Review Officer, who will investigate the nature of the
positive result with the employee/applicant. If the positive is the result of legitimate prescription drug use, the result will be reported to the employer as “negative.” If there is no reasonable medical explanation for the positive result, it will be reported to the employer as “positive.” Employees with a confirmed positive result will be immediately removed from work and referred to counseling through the EAP Program.

5. If the drug test result is reported as a Negative Dilute, the employee will be required to retest. If the creatinine level is 2mg/dl – 5mg/dl the Medical Review Officer will perform a recollection under direct observation. If the creatinine level is over 5 mg/dl the recollection will not be under direct observation.

6. Employees who refuse a drug test or test positive will be subject to corrective action, up to and including termination.

B. Alcohol Testing

1. Testing for alcohol will be accomplished via breath. If breath alcohol testing is not available at the treating medical facility, a blood alcohol test may be performed.

2. The action levels for alcohol will follow those established by the Department of Transportation:
   a. Test results <.02 will be considered negative.
   b. A screening test result >.02 will trigger a second, confirmatory breath alcohol test in 15-30 minutes.
   c. If the confirmation result is >.02, the testing facility will notify the employer.
3. Any employee with a breath alcohol result >.02 will be subject to corrective action, up to and including termination.

4. If an individual will not or cannot provide a sufficient breath, he/she will be evaluated by a physician of the Company’s choice. If the physician cannot find a legitimate medical explanation for the inability to provide sufficient breath, the individual will be considered to have refused to test.

V. RETURN TO WORK
A. An employee will be permitted to return to work after completion of one counseling session along with the recommendation from the treating provider and producing a negative drug test result which will be at the employee’s expense. Continued employment will be contingent upon the employee following the treating provider’s treatment plan and will be subject to periodic, random drug and/or alcohol follow-up testing.

B. Should a third future random follow-up, post-injury, or “reasonable cause” drug or alcohol test be confirmed positive, the employee will be terminated immediately and will not be eligible for rehire.

C. As a condition of employment, employees going through or having completed a rehabilitation program are required to achieve and maintain a satisfactory level of job performance, personal conduct and attendance. Failure to do so can result in corrective action up to and including termination of employment.

VI. ENFORCEMENT
A. The unauthorized use or possession of alcohol or illegal drugs on company property or while on company business is prohibited and subjects the employee to
corrective action up to and including termination of employment.

B. An employee reporting to work with a detectable level of illegal drugs in his/her system or with a blood alcohol content (BAC) of .02 or greater will be subject to corrective action, up to termination.

C. The sale, trade or delivery of an illegal drug on company property or while on company business is prohibited and cause for immediate termination of employment. IB Abel will, at its discretion, refer instances of sale, trade or delivery of illegal drugs to the proper legal authorities.

D. IB Abel will notify and cooperate with law enforcement, private investigation or security firms should reasonable information indicate the presence of illegal drugs on company property or the involvement of an employee in illegal drug activity.

E. Where the Company has reason to believe that an employee is in violation of the Company’s Substance Abuse policy, he or she may be asked to submit immediately to a search of his or her person and/or to make his or her toolbox, lunch box, packages, personal belongings, vehicles or any other receptacle he or she uses or has access to, available for inspection. Such search or inspection shall always be conducted in the presence of at least one witness other than the Company representative performing the search or inspection, and the contents resulting from such search or inspection shall be inventoried. Entry onto Company or customer premises (including parking lots) to perform work for the Company constitutes consent to search and inspection. Refusal to consent to search or inspection shall be considered grounds for which an employee may be disciplined, up to and including termination.
DISCIPLINARY ACTION POLICY

I. Typical Progression of Disciplinary Action. This is a typical progression of the disciplinary progress. However, the Company reserves the right to initiate the disciplinary process at any point in the sequence depending on the seriousness of the issue(s) concerned.
   A. Informal meeting/coaching
   B. Verbal warning
   C. Written warning
   D. HR conference/final written warning
   E. Suspension or termination

II. Progressive Discipline/Corrective Action Checklist. The following checklist outlines the supervisor’s responsibility for taking disciplinary/corrective action.
   A. Before the meeting
      1. Ensure that there is a valid job-related reason for the disciplinary action.
      2. Investigate the facts and review them objectively.
      3. Ensure consistency with any prior disciplinary actions and consistency with Company policy.
      4. Arrange to meet with the employee privately. Do not discipline the employee in public or in front of other workers.
      5. Prepare by reviewing your notes about the specific incident/problem and any past discipline you have taken, either verbal or written.
      6. Consult with your supervisor/and or the Human Resources Department for guidance in addressing the issue(s) with the employee, or for the clarification of any Company policies or procedures.
   B. During the meeting
      1. Meet with the employee in a non-confrontational manner.
      2. Explain to the employee why you’ve called the meeting.
3. Review the Company’s policy with the employee, and explain what steps (if any) have been taken already and what the next step is.
4. State the specific problem in terms of actual conduct and desired conduct.
5. Clearly explain future expectations and consequences.
6. Give the employee a chance to respond, explain or defend his or her actions.
7. Acknowledge the employee’s response and include it in your notes of the discipline session.
8. Tell the employee that you expect his or her behavior to change. Give specific examples and suggestions.
9. Indicate your confidence in the employee’s ability and willingness to change the behavior.
10. Have the employee repeat back to you or otherwise confirm that he or she understands the problem and is clear on what changes are expected. Try to get a commitment from the employee to resolve the problem.
11. Complete the corrective action form (if needed) and be sure that both you and the employee sign it. Give the employee a copy of the form.
12. Reassure the employee that you value his or her work and that you want to work with the employee to make sure he or she can continue to work for the Company.

C. After the meeting
   1. Forward the corrective action form to the appropriate party.
   2. Monitor the employee’s behavior and performance to be sure that the problem has been corrected.

III. Dismissal & Disciplinary Action
    A. In the event that an employee engages in any of the following practices, he/she will be subject to disciplinary action. When violations occur, it becomes necessary to consider the facts and circumstances of the individual case, the employee’s
length of service and employment record to determine what discipline is warranted.

B. The following is a partial list of the kind of improper conduct which, when engaged in, shall constitute grounds for disciplinary action, up to and including discharge.

1. Dishonesty, including any falsification or misrepresentation, proving incomplete, misleading or incorrect information in connection with the preparation of any Company records, including an application for employment.

2. Stealing or sabotage of equipment, tools and/or other property belonging to any customer, employee or the Company.

3. Removal from the Company premises any Company property or the property of others.

4. Willful damage, abuse, or destruction of Company property or the property of others.

5. Absence from Company for three consecutive days without authorization or acceptable excuse.

6. Possession, sale or use of intoxicating beverages or drugs on Company property, or reporting to work under the influence of intoxicating beverages or drugs, or other violations of the drug and alcohol policy.

7. Unauthorized use, possession, conveyance or storage of any firearms, explosives or other dangerous weapons on Company premises.

8. Insubordination, including refusal to perform work required by a supervisor.

9. The use of profane, abusive, or threatening language toward fellow employees, customers, guests or supervisors.

10. Fighting, coercing, interfering with or threatening bodily injury to other employees, customers, guests or supervisors.
11. Gambling of any kind, including but not limited to bookmaking or numbers writing.
12. Immoral conduct or indecency.
13. Any act which might endanger the safety or life of others, including horseplay.
14. Willful, deliberate or repeated violation of Company safety rules.
15. Deliberate delaying or restricting services or work effort, or inciting others to delay or restrict time.
16. Failure to report to work upon expiration of a vacation, holiday or leave of absence or upon being called back after a layoff.
17. Disclosure of confidential Company information to unauthorized persons.
18. Any other conduct which is of serious nature and which, in the sole opinion of the Company, makes the employee unfit for further service or warrants discharge.
CONCRETE AND MASONRY

I. General requirements.
   A. All protruding reinforcing steel, onto or into which employees could fall, shall be guarded to eliminate the hazard of impalement.
   1. “Mushroom” style rebar caps may only be used on horizontally protruding rebar.
   B. Measures shall be taken to ensure unrolled wire mesh does not recoil.
   C. No employees shall be permitted to ride concrete buckets.
   D. No employees shall be permitted to work beneath concrete buckets.
   1. Elevated concrete buckets shall be routed so that no employees, or the fewest number possible, are exposed to the overhead hazard.
   E. Trowel machines must be equipped with a safety switch that automatically cuts off if the operator’s hands leave the handles.
   F. Bull float handles used where they might contact energized electrical conductors shall be non-conductive.
   G. Masonry saws shall have the blade guarded.

II. Concrete
   A. Employees shall take precautions to prevent prolonged contact with concrete. Overboots are required when employees will be standing in poured concrete.
   B. Safety glasses are required whenever employees are exposed to splashing concrete such as while operating the chute, hoses, pour areas, magic screed, etc.
   C. Formwork shall be erected, supported, braced and maintained so that it will be capable of supporting any loads imposed on it.
   D. Form scaffolds shall comply with the requirements of the Scaffolding Chapter.
   E. No employees are permitted below pre-cast panels while they are being erected.
III. Masonry
   A. A limited access zone shall be established where masonry walls are being constructed.
      1. The limited access zone shall restrict access to all employees except those engaged in the construction of the wall.
      2. The limited access zone shall be equal to the height of the wall plus four feet and shall run the entire length of the wall.
   B. Masonry walls over eight feet in height shall be braced to prevent collapse unless it is adequately supported so that it will not overturn or collapse.
PERMIT REQUIRED CONFINED SPACES

I. Scope. I. B. Abel has established a permit required confined spaces program to protect employees who are exposed to the hazards associated with working in permit required confined spaces. Abel may follow the Permit Required Confined Spaces Program of a Host Employer as long as it meets or exceeds the requirements in this section.

II. Definitions:
   A. Confined Space means a space that
      1. Is large enough that an employee can bodily enter and perform assigned work, and
      2. Has limited means for entry and exit
      3. Is not designed for continuous employee occupancy.
      4. Examples include tanks, vaults, manholes, vessels, and storage bins with limited access.
   B. Permit Required Confined Space (also referred to as permit spaces) means a confined space that has one or more of the following characteristics:
      1. Contains or has the potential to contain a hazardous atmosphere.
      2. Contains a material that has the potential to engulf an entrant.
      3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section; or
      4. Contains any other recognized serious safety or health hazard.
   C. Acceptable Entry Conditions means the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit required confined space entry can safely enter into and work within the space (see General Requirements for specific atmospheric conditions).
   D. Prohibited Condition means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.
E. Attendant means an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all of the attendants duties as assigned in this program.

F. Authorized Entrant means an employee who is authorized by the Job Superintendent, Foreman or Safety Director to enter a permit space.

G. Entry Permit means the written or printed document that is provided to allow and control entry into a permit space and that contains the information required by this program.

III. Host Employer Requirements. This section lists the requirements of the Host Employer if Abel employees are to enter a confined space or permit required confined space at a client’s facility.

A. Inform Abel employees that permit spaces exist in work areas

B. Inform Abel employees of the hazards identified and the host employer’s experience with the space that makes the space in question a permit space (ex. oxygen deficiency, engulfment, toxic materials, etc.)

C. Inform Abel employees of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where Abel will be working.

D. Coordinate entry procedures when the Host Employer will be working in or near permit spaces at the same time as Abel so that employees of the Host Employer and employees of Abel do not endanger one another inadvertently.

IV. Abel Requirements: It is the responsibility of Abel, through the Foreman or Safety Department to:

A. Determine if confined spaces or permit spaces need to be entered on the project.

B. If permit spaces need to be entered at the facility of a Host Employer:
   1. Obtain any information available regarding permit space hazards and entry operations from the Host Employer.
   2. Coordinate entry procedures with the Host Employer when Abel will be working in or near permit spaces at
the same time as the Host Employer so that employees of the Host Employer and Abel do not endanger one another inadvertently.

V. General Requirements for Entering Permit Spaces
A. Employees of Abel must be aware of the hazards associated with any permit space before entry is permitted.
B. Necessary procedures and practices for safe entry into the permit space must be completed prior to entry. These include but are not limited to:
   1. Specifying acceptable entry conditions.
   2. Isolating the permit space through lockout/tagout, line breaking, blanking or other procedures.
   3. Purging, inerting, flushing and/or ventilating the permit space as necessary to eliminate or control atmospheric hazards.
   4. Providing pedestrian, vehicle or other barriers as necessary to protect entrants from external hazards.
   5. Verifying that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.
C. Air Monitoring. Permit space conditions must be evaluated as follows when entry operations are conducted:
   1. Test the conditions in the permit space to determine if acceptable entry conditions exist before entry is authorized to begin.
   2. Test or monitor the permit space as necessary to determine if acceptable entry conditions are being maintained in the course of entry operations.
   3. When testing for atmospheric hazards, use a multi-gas meter from the Safety Department. These monitor for oxygen, lower explosive limit, carbon monoxide, and hydrogen sulfide simultaneously.
   4. Additional air monitoring equipment may be needed based on the potential atmospheric hazards. Contact the Safety Department for air monitoring requests.
Acceptable Entry Conditions:

<table>
<thead>
<tr>
<th>Component</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen (O₂)</td>
<td>19.5% &lt; O₂ &lt; 23.5%</td>
</tr>
<tr>
<td>Flammable Gases or Vapors (LEL)</td>
<td>&lt;10% LEL</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>&lt;35 ppm</td>
</tr>
<tr>
<td>Hydrogen Sulfide (sewer gas)</td>
<td>&lt;10 ppm</td>
</tr>
<tr>
<td>Other Specific Toxins</td>
<td>&lt; OSHA Permissible Exposure Limit (PEL)</td>
</tr>
<tr>
<td>Airborne Combustible Dusts</td>
<td>obscured vision at a distance of 5’ or less</td>
</tr>
</tbody>
</table>

D. Provide at least one attendant outside the permit space into which entry is authorized for the duration of entry operations. NOTE: Attendants may be assigned to monitor more than one permit space provided the duties described later in this program (“Duties of Attendants”) can effectively be performed for each permit space that is monitored.

1. If multiple spaces are to be monitored by a single attendant, means and procedures must be developed to enable the attendant to respond to an emergency in one or more of the permit spaces without distraction from the attendants responsibilities to any other permit spaces.

E. Designate the persons who have active roles (for example, authorized entrants, attendants, entry supervisors or persons who test or monitor the atmosphere in a permit space) in entry operations, ensure that each such employee is aware of his/her duties and has had the appropriate training.

F. Ensure that procedures for rescue have been developed prior to entry, including procedures for rescuing entrants from permit spaces, providing necessary emergency services to
rescued employees and for preventing unauthorized employees from attempting a rescue.

G. Permits must be completed fully and authorized by the entry supervisor prior to entry.

H. Completed permits must be posted at the entrance to the permit space prior to entry.

I. Expired and cancelled permits must be returned to the Safety Dept. or the Host Employer.

J. An I. B. Abel permit must be filled out for all permit required confined space operations. Permits issued from a Host Employer may be substituted only if it contains the same information required on an Abel issued permit.

VI. Duties of Authorized Entrants:

A. Each Entrant shall:
   1. Know the hazards that may be faced during entry, including information on the mode, signs or symptoms and consequences of the exposure.
   2. Properly use all equipment issued for entry operations.
   3. Communicate as necessary with the attendant to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space as required by the conditions listed under “Duties of Attendants”.
   4. Alert the attendant whenever:
      a) The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.
      b) The entrant detects a prohibited condition.

B. Exit from the space as quickly as possible whenever:
   1. An order is given to evacuate by the attendant or entry supervisor
   2. The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.
   3. The entrant detects a prohibited condition.
   4. An evacuation alarm is activated

VII. Duties of Attendants:

A. Each Attendant shall:
1. Know the hazards that may be faced during entry, including information on the mode, signs or symptoms and consequences of the exposure.

2. Be aware of possible behavioral effects of hazard exposure in authorized entrants.

3. Continuously maintains an accurate count of authorized entrants in the permit space and their identities.

4. Remain outside the permit space until relieved by another attendant.

5. NOTE: Attendants are not authorized to enter permit spaces to attempt rescues unless they have been properly trained in confined space rescue and they have been relieved by another attendant.

6. Communicate with authorized attendants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space.

7. Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and order the authorized entrants to evacuate the permit space immediately under any of the following conditions:
   a) If the attendant detects a prohibited condition.
   b) If the attendant detects the behavioral effects of hazard exposure in an authorized attendant.
   c) If the attendant detects a situation outside the space that could endanger the authorized entrants.
   d) If the attendant cannot effectively and safely perform all of the duties listed in this section.

8. Summon rescue and other emergency services as soon as the attendant determines that the authorized entrants may need assistance to escape from permit space hazards.

9. Take the following actions when unauthorized persons approach or enter a permit space while entry is under way:
   a) Warn the unauthorized persons that they must stay away from the permit space.
b) Advise the unauthorized person that they must exit immediately if they have entered the permit space.

c) Inform the authorized entrants and entry supervisor if unauthorized persons have entered the permit space.

10. Perform non-entry rescues when possible, such as using a winch and tripod during vertical entries.

11. Perform no duties that might interfere with the attendant’s primary duty to monitor and protect the authorized entrants.

VIII. Duties of Entry Supervisors:

A. The supervisor of the crew performing the confined space entry is designated as the entry supervisor. Each Entry Supervisor shall:

1. Know the hazards that may be faced during entry, including information on the mode, signs or symptoms and consequences of the exposure.

2. Verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.

3. Terminate the entry and cancels the permit when entry operations are completed or if a condition that is not allowed under the entry permit arises in or near the permit space.

4. Verify that rescue services are available and that the means for summoning them are available.

5. Remove unauthorized individuals who enter or who attempt to enter the permit space during entry operations.

IX. Rescue and Emergency Services:

A. Employees of I. B. Abel, Inc. shall not enter permit spaces for the purpose of attempting confined space rescues. If necessary, arrangements must be made for an outside party to
be available for rescue (Host Employer rescue team, Fire Dept.).

B. The rescue service must be informed of the hazards they may confront when called upon to perform rescues.

C. To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.

D. A mechanical device such as a tripod and winch shall be available to retrieve personnel from vertical type permit spaces more than five feet deep.

E. If an injured entrant is exposed to a substance for which a Material Safety Data Sheet (MSDS) is required, the MSDS must be made available to the medical facility treating the exposed entrant.
CRANES AND RIGGING

I. General Crane Safety.
   A. The operator must know the weight of the load.
   B. The operator must know the pick and set radius of the load to be picked.
   C. The operator must know if the load is in the structural or tipping portion of the load chart.
   D. Rated load capacities, and recommended operating speeds, special hazard warnings, or instruction, shall be posted on all cranes. Instructions and warnings must be visible to the operator in the cab.
   E. Proper hand signals shall be used to signal the operator. Only one employee shall signal the operator at a time. The operator shall not hoist a load if incorrect signals are used, if more than one employee tries to signal the crane, or the operator is unclear of the signal (see hand signals chart).
   F. Belt, gears and other rotating or reciprocating parts employees may be exposed to must be guarded.
   G. Accessible areas within the swing radius of the counterweight must be barricaded.
   H. Cranes operating close to overhead power lines shall be protected from contact with the energized lines by one of the following methods:
      1. The lines shall be de-energized and grounded, or
      2. Barriers, not a part of the crane, shall be erected to prevent contact, or
      3. A minimum safe distance of ten feet shall be maintained around all overhead power lines. For lines exceeding 50 kV, a distance of four inches for every additional 10kV shall be added.
   I. Make sure the crane is set up on a firm foundation, with adequate cribbing, and deploy all outriggers. Make sure the crane is level.
   J. Keep workers clear of loads about to be lifted and suspended loads. Warn any unnecessary personnel or stragglers in the area.
K. Loads shall not be swung or suspended over persons.
L. When picking a load, start, stop, and swing slowly.
M. Watch for defective rigging equipment or poor rigging technique.
N. The operator must be alert at all times. The operator may not leave the cab with a load on the crane.

II. Crane Inspections.
A. All cranes are to be inspected annually and certification shall be kept on file.
B. The operator shall inspect the crane before each use and during use. Deficiencies shall be repaired, or defective parts replaced, before continued use. Inspections shall be documented on a crane inspection checklist daily.

III. Crane Suspended Personnel Platforms (manbaskets). With the exception of steel erection, manbaskets may only be used if all other options have been considered and have been determined to be infeasible or more hazardous.
A. The total weight of the pick may not exceed 50% of the rated capacity for the radius and configuration of the crane.
B. Cranes must be equipped with an anti-two-block device.
C. Only approved manbaskets may be used for hoisting personnel. Baskets may not be job made.
D. Manbaskets may not be used for hoisting only tools, equipment or materials.
E. A proof test shall be conducted whenever a manbasket is delivered to a job site. The proof test consists of lifting a test weight 125% of the basket’s capacity and holding it for five minutes. At the end of five minutes the rigging and basket are checked for defects.
F. A trial lift shall be made every time the crane is set up in a new location to hoist employees. The trial lift shall follow these procedures:
   1. The empty basket shall be lifted to each area personnel are to be lifted to
   2. After the trial lift, the basket, the crane, and the rigging shall be inspected for defects
G. In addition to a full guardrail and expanded metal around the basket, employees will be protected from falling by the use of personal fall arrest systems.

IV. General Rigging Safety
A. The rigger must know the weight of the load and the rated capacities of any slings or rigging hardware. Do not exceed these capacities.
B. Know the center of gravity of the load. Attach the load above the center of gravity or secure the load.
C. Select the sling best suited to the load and select a hitch that will hold and control the load.
D. Inspect all rigging equipment prior to each use.
E. Protect slings from sharp edges.
F. Allow for reductions in sling capacity when using choker hitches or severe sling angles (see diagram).
G. Use only alloy chain (Grade 80) when lifting with chain slings.

V. Rigging Inspections
A. Synthetic Web Slings. Synthetic web slings should be replaced under any of the following conditions:
   1. Acid or caustic burns
   2. Burned melted or charred
   3. Snags, punctures, tears or cuts
   4. Broken or worn stitching
   5. Excessive fraying, red warning threads visible
   6. Tag missing or illegible
   7. Ultraviolet sunlight damage
   8. Any other conditions which may reduce the capacity.
B. Wire rope slings. Wire rope slings should be replaced under any of the following conditions:
   1. Missing or illegible tag
   2. 10 Randomly broken wires in one lay or 5 broken wires in one strand in one lay
   3. Kinking, crushing, birdcaging or other damage to the braided structure of the rope
   4. Heat damage
   5. Severe corrosion or pitting
6. Damaged end attachments
7. Bent hooks

C. Chain Slings. Chain slings should be replaced under any of the following conditions:
1. Missing or illegible tag
2. Excessive wear
3. Twisted, bent or cut links
4. Cracked welds in the links
5. Severe nicks and gouges
6. Excessively stretched links
7. Severe corrosion
8. Worn or damaged master link
9. Bent hooks

**SLING ANGLES**

How do you carry two buckets of water? The illustration to the left typifies the stresses imposed on slings when the legs are attached to the load at various angles.
Mechanical Splice

IWRC

Vertical, Choker or Vertical Basket
Rated capacity in tons of 2,000 lbs.

Rate capacities shown apply only to 6X19 and 6X37 classification wire rope.

<table>
<thead>
<tr>
<th>Rope Diameter (Inches)</th>
<th>IPS</th>
<th>EIPS</th>
<th>EEIPS</th>
<th>IPS</th>
<th>EIPS</th>
<th>EEIPS</th>
<th>IPS</th>
<th>EIPS</th>
<th>EEIPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>0.56</td>
<td>0.65</td>
<td>0.71</td>
<td>0.41</td>
<td>0.48</td>
<td>0.52</td>
<td>1.1</td>
<td>1.3</td>
<td>1.4</td>
</tr>
<tr>
<td>5/16</td>
<td>0.87</td>
<td>1.0</td>
<td>1.1</td>
<td>0.64</td>
<td>0.74</td>
<td>0.81</td>
<td>1.7</td>
<td>2.0</td>
<td>2.2</td>
</tr>
<tr>
<td>3/8</td>
<td>1.2</td>
<td>1.4</td>
<td>1.6</td>
<td>0.92</td>
<td>1.1</td>
<td>1.2</td>
<td>2.5</td>
<td>2.9</td>
<td>3.2</td>
</tr>
<tr>
<td>7/16</td>
<td>1.7</td>
<td>1.9</td>
<td>2.1</td>
<td>1.2</td>
<td>1.4</td>
<td>1.6</td>
<td>3.4</td>
<td>3.9</td>
<td>4.3</td>
</tr>
<tr>
<td>1/2</td>
<td>2.2</td>
<td>2.5</td>
<td>2.8</td>
<td>1.6</td>
<td>1.9</td>
<td>2.0</td>
<td>4.4</td>
<td>5.1</td>
<td>5.5</td>
</tr>
<tr>
<td>9/16</td>
<td>2.8</td>
<td>3.2</td>
<td>3.5</td>
<td>2.0</td>
<td>2.4</td>
<td>2.6</td>
<td>5.5</td>
<td>6.4</td>
<td>7.0</td>
</tr>
<tr>
<td>5/8</td>
<td>3.4</td>
<td>3.9</td>
<td>4.3</td>
<td>2.5</td>
<td>2.9</td>
<td>3.2</td>
<td>6.8</td>
<td>7.8</td>
<td>8.6</td>
</tr>
<tr>
<td>3/4</td>
<td>4.9</td>
<td>5.6</td>
<td>6.2</td>
<td>3.6</td>
<td>4.1</td>
<td>4.5</td>
<td>9.7</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>7/8</td>
<td>6.6</td>
<td>7.6</td>
<td>8.3</td>
<td>4.8</td>
<td>5.6</td>
<td>6.1</td>
<td>13</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>1</td>
<td>8.5</td>
<td>9.8</td>
<td>11</td>
<td>6.3</td>
<td>7.2</td>
<td>8.0</td>
<td>17</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>1 1/8</td>
<td>10</td>
<td>12</td>
<td></td>
<td>7.9</td>
<td>9.1</td>
<td></td>
<td>21</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>1 1/4</td>
<td>13</td>
<td>15</td>
<td></td>
<td>10</td>
<td>11</td>
<td></td>
<td>26</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>1 3/8</td>
<td>15</td>
<td>18</td>
<td></td>
<td>12</td>
<td>13</td>
<td></td>
<td>31</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>1 1/2</td>
<td>18</td>
<td>21</td>
<td></td>
<td>14</td>
<td>16</td>
<td></td>
<td>37</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>1 5/8</td>
<td>21</td>
<td>24</td>
<td></td>
<td>16</td>
<td>18</td>
<td></td>
<td>43</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>1 3/4</td>
<td>25</td>
<td>28</td>
<td></td>
<td>19</td>
<td>21</td>
<td></td>
<td>49</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>32</td>
<td>37</td>
<td></td>
<td>24</td>
<td>28</td>
<td></td>
<td>64</td>
<td>73</td>
<td></td>
</tr>
</tbody>
</table>

Rated capacities basket hitch based on D/d ratio of 25
Rated capacities based on pin diameter no larger than natural eye width or less than the nominal sling diameter.
Rated capacities based on design of 5
Horizontal sling angles less than 30 degrees shall not be used.
**Lower the Boom and Raise the Load** - with arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.

**Raise the Boom and Lower the Load** - with arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.

**Hoist** - with forearm vertical, forefinger pointing up, move hand in small horizontal circles.

**Lower** - with arm extended downward, forefinger pointing down, move hand in small horizontal circles.

**Use Main Hoist** - tap fist on head and then use regular signals.

**Use Whipline** - (auxiliary hoist) tap elbow with one hand then use regular signals.

**Raise Boom** - arm extended, fingers closed, thumb pointing upward.

**Lower Boom** - arm extended, fingers closed, thumb pointing downward.

**Move Slowly** - use one hand to give motion signal and place other hand motionless in front of hand giving the motion signal (hoist slowly shown as example).

**Hoist** - with forearm vertical, forefinger pointing up, move hand in small horizontal circles.

**Lower** - with arm extended downward, forefinger pointing down, move hand in small horizontal circles.

**Use Main Hoist** - tap fist on head and then use regular signals.

**Use Whipline** - (auxiliary hoist) tap elbow with one hand then use regular signals.

**Raise Boom** - arm extended, fingers closed, thumb pointing upward.

**Lower Boom** - arm extended, fingers closed, thumb pointing downward.

**Move Slowly** - use one hand to give motion signal and place other hand motionless in front of hand giving the motion signal (hoist slowly shown as example).
Swing- arm extended, point with finger in the direction of swing of boom.

Stop- arm extended, palm down, move arm back and forth horizontally.

Emergency Stop- both arms extended, palms down, move arms back and forth horizontally.

Travel- arm extended forward, hand open and slightly raised, making pushing motion in direction of travel.

Dog Everything- Clasp hands in front of body.

Travel (both tracks)- Use both fists in front of body, making a circular motion about each other, indication direction of travel, forward and backward.

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.

Extend Boom- (telescoping booms) both fists in front of body with thumbs pointing outward.

Retract Boom- (telescoping booms) both fists in front of body with thumbs pointing toward each other.
CUTTING AND WELDING SAFETY POLICY

I. Scope. This section addresses the hazards associated with the cutting and welding of metals.

II. Gas welding and cutting.

A. Transporting, moving and storing compressed gas cylinders (oxygen, acetylene, argon, etc.). The following rules and precautions shall be followed for all compressed gas cylinders regardless of their contents or whether they are empty or full.

1. Valve protection caps shall be in place and secured when cylinders are not in use.

2. When cylinders are hoisted they shall be secured on a cradle, slingboard or pallet. They shall not be hoisted or transported by means of magnets or choker slings.

3. Cylinders shall be moved by tilting them and rolling them on their bottom edges. They shall not be intentionally dropped, struck or permitted to strike each other violently.

4. When cylinders are transported by a powered vehicle, they shall be secured in a vertical position.

5. Valve protection caps shall not be used for lifting cylinders. Bars shall not be used under valve protection caps to pry cylinders loose if they become frozen together.

6. Unless cylinders are firmly secured on a cart specifically designed for carrying cylinders, regulators shall be removed and valve protection caps replaced before cylinders can be moved.

7. A suitable cylinder truck, chain or other means shall be used to prevent cylinders from falling over while in use.

8. When work is finished, when cylinders are empty, or when cylinders are moved at any time, the cylinder valve shall be closed.

9. Compressed gas cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time when being moved.
10. Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of at least 20 feet or by a noncombustible barrier at least 5 feet high with a fire resistance rating of at least one-half hour.

11. Inside of buildings, cylinders shall be stored in well ventilated, well protected, dry locations at least 20 feet from highly combustible materials. Assigned storage areas shall be located away from elevators, stairways, or gangways. Storage areas shall also be located where cylinders will not be knocked over, damaged by passing or falling objects or tampered with by unauthorized personnel. Cylinders shall not be kept in unventilated enclosures such as lockers or gang boxes.

B. Placement of cylinders.
   1. Cylinders shall be kept far enough away from the actual cutting or welding process so that sparks, hot slag or flame will not reach them.
   2. Cylinders shall be placed where they cannot become part of an electrical circuit. Electrodes shall not be struck against a cylinder to strike an arc.
   3. Fuel gas cylinders shall be placed with valve end up whenever they are in use.
   4. Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.

C. Treatment of cylinders.
   1. Cylinders, whether empty or full, shall not be used as rollers or supports.
   2. Employees shall not attempt to mix gases in a cylinder, refill a cylinder or use a cylinder for purposes other than the purposes intended by the supplier.
   3. No damaged or defective cylinders shall be used.

D. Use of fuel gas.
   1. Before connecting a regulator to a cylinder valve, crack the valve slightly to clear any dirt or debris. Stand to one side of the valve when cracking it and be certain the fuel gas cannot reach another hot work operation.
2. Cylinder valves should always be opened slowly to prevent damage to the regulator. Valves should not be opened more than 1 ½ turns so they may be closed quickly in an emergency. When a special wrench is needed to open a valve, it shall be left on the valve while it is open.

3. Fuel gases shall always be used at pressures reduced through a regulator.

4. Before a regulator is removed from a cylinder valve, the cylinder valve shall be closed and gas released from the regulator.

5. Cylinders found to be leaking shall be removed from the work area.

E. Hose.
   1. Hoses shall be inspected at the beginning of each shift.
   2. Hose which has been subjected to flashback, or which shows evidence of severe wear or damage, shall be tested to twice the normal pressure to which it is subject, but in no case less than 300 p.s.i.
   3. Couplings shall be of the type that cannot be unlocked or disconnected by a straight pull without rotary motion.
   4. Boxes used for the storage of hoses shall be ventilated.
   5. Hoses, cable and other equipment shall be kept clear of passageways, ladders and stairs.

F. Torches.
   1. Clogged torch tips shall be cleaned with suitable cleaning wires, drills or other devices designed for that purpose.
   2. Torches shall be inspected at the beginning of each shift for leaking shutoff valves, hose couplings, and tip connections.
   3. Torches shall be lighted by friction devices, and not matches or hot work.

G. Miscellaneous
   1. Oxygen and fuel gas pressure regulators and their gauges must be in proper working order while in use.
2. Oxygen can make oil or grease spontaneously ignite. Oxygen cylinders and fittings shall be kept away from oil or grease. Cylinders, cylinder caps and valves, couplings, regulators, hose, and apparatus shall be kept free from oil or greasy substances and shall not be handled by oily hands or gloves. Oxygen shall not be directed at oily surfaces, greasy clothes, or within a fuel oil or other storage tank or vessel.

III. Arc welding and cutting
   A. Manual electrode holders.
      1. Any current carrying parts passing through the portion of the holder which the cutter or welder grips in his hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to ground.
   B. Welding cables and connectors.
      1. All cables shall be of the flexible type and fully insulated capable of handling the maximum current requirements of the work in progress.
      2. Welding leads must be free of repair or splice within ten feet of the stinger.
   C. Ground returns and machine grounding
      1. A ground return cable shall have a safe current carrying capacity equal to or exceeding the specified maximum output capacity of the welding machine it is servicing.
      2. Pipelines containing gases or flammable liquids, or electrical conduits, shall not be used as a ground return.
      3. The generation of an arc, spark or heat at any point shall cause rejection of a structure as a ground circuit.
      4. The frames of all welding machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the structure, shall be checked to ensure that the circuit between the ground and grounded power conductor has resistance low
enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

D. Safe operating instructions.
1. When electrode holders are left unattended, the electrodes shall be removed and the holder shall be placed so as to prevent accidental contact with employees or conducting objects.
2. Hot electrode holders must be kept away from water.
3. When the welder will be away from the electrode holder for any appreciable length of time, such as breaks or lunch, or when the machine is to be moved, the power supply switch to the machine must be opened.
4. Whenever possible, all arc welding and cutting operations shall be shielded to protect employees and other persons in the area from the direct rays of the arc.

E. Fire prevention.
1. When possible, welding or cutting should be done in a designated area free of combustible materials. If the object to be welded or cut cannot be moved, all movable fire hazards in the vicinity shall be moved to a safe place or otherwise guarded.
2. If the object to be welded or cut cannot be moved, positive actions must be taken to contain the release of hot slag, sparks and flame.
3. No welding, cutting or heating of objects shall be done where the application of flammable paints or the presence of other flammable compounds, or heavy dust concentrations create a hazard.
4. Suitable fire extinguishing equipment shall be immediately available and shall be maintained in a state of readiness for instant use.
5. When the welding, cutting or heating operation is such that normal fire prevention precautions are not sufficient, a firewatch shall be posted while the actual welding, cutting or burning are being conducted and for a thirty minute period afterward to ensure that no
possibility of fire exists. The firewatch must be made aware of the specific nature of any anticipated fire hazards and how the firefighting equipment provided is to be operated.

6. Before heat is applied to a drum, container or hollow structure, a vent or opening shall be provided for the release of any built-up pressure during the hot work operation.

F. Ventilation.

1. Contaminated air exhausted through either general mechanical ventilation or local exhaust ventilation shall be discharged into the open air or otherwise clear of the source of intake air.

2. Oxygen shall not be used for ventilation purposes, comfort cooling, blowing dust off of clothing or for cleaning the work area.

G. Welding and cutting in confined spaces.

1. Ventilation shall be provided whenever welding, cutting or other hot work is conducted within a confined space.

2. When sufficient ventilation cannot be obtained without blocking access to the confined space, employees in the space shall be protected by air supplying respirators.

H. Welding, cutting or heating of metals of toxic significance.

1. Welding, cutting or heating in any enclosed spaces involving the metals specified in this section shall be performed with general mechanical or local exhaust ventilation.
   a) Zinc-bearing base or filler metals or metals coated with zinc-bearing materials.
   b) Cadmium-bearing filler metals.
   c) Chromium-bearing metals or metals coated with chromium-bearing materials.

2. Welding, cutting or heating in any enclosed space involving the metals specified in this section shall be performed with local exhaust ventilation, or employees shall be protected by air supplying respirators.
a) Metals containing lead, other than as an impurity, or metals coated with lead-bearing materials
b) Cadmium-bearing or cadmium-coated base metals.
c) Metals coated with mercury-bearing metals.
d) Beryllium-containing base or filler metals. Because of its high toxicity, welding or burning operations involving beryllium should be performed with both local exhaust ventilation and airline respiratory protection.

3. Employees performing such operations in the open air shall be protected by air-purifying respirators with appropriate filters.

4. Other employees exposed to the same hazards as those created by welders shall be afforded the same protection.

IV. Inert-gas metal-arc welding.

A. The inert-gas metal-arc (MIG, TIG) welding process involves: the production of ultra-violet radiation of intensities of 5 to 30 times that produced during shielded metal arc (stick) welding; the decomposition of chlorinated solvents (methylene chloride, trichloroethylene) by ultra-violet rays; and the liberation of toxic fumes and gases. Employees shall not be permitted to be engaged in, or be exposed to the process until the following special precautions have been taken:

1. The use of chlorinated solvents shall be kept at least 200 feet, unless shielded, from the exposed arc, and surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is permitted on the surface.

2. Employees in the area not protected by screening shall be protected by appropriate filter lenses.

3. Welders and other employees exposed to radiation shall be protected so that the skin is protected to prevent burns and other damage by ultra-violet rays.
V. Eye protection

<table>
<thead>
<tr>
<th>Welding operation</th>
<th>Shade number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shielded metal arc welding 1/16, 3/32, 1/8, 5/32 inch diameter electrode</td>
<td>10</td>
</tr>
<tr>
<td>Gas shielded arc welding (non-ferrous) 1/16, 3/32, 1/8, 5/32 inch diameter electrode</td>
<td>11</td>
</tr>
<tr>
<td>Gas shielded arc welding (non-ferrous) 1/16, 3/32, 1/8, 5/32 inch diameter electrode</td>
<td>12</td>
</tr>
<tr>
<td>Shielded metal arc welding 3/16, 7/32, 1/4 inch diameter electrode</td>
<td>12</td>
</tr>
<tr>
<td>Shielded metal arc welding 5/16, 3/8 inch diameter electrode</td>
<td>14</td>
</tr>
<tr>
<td>Atomic hydrogen welding</td>
<td>10-14</td>
</tr>
<tr>
<td>Carbon-arc welding</td>
<td>14</td>
</tr>
<tr>
<td>Soldering</td>
<td>2</td>
</tr>
<tr>
<td>Torch brazing</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Light cutting, up to 1”</td>
<td>3 or 4</td>
</tr>
<tr>
<td>Medium cutting, 1” to 6”</td>
<td>4 or 5</td>
</tr>
<tr>
<td>Heavy cutting, over 6”</td>
<td>5 or 6</td>
</tr>
<tr>
<td>Gas welding, light up to 1/8”</td>
<td>4 or 5</td>
</tr>
<tr>
<td>Gas welding, medium 1/8” to 1/2”</td>
<td>5 or 6</td>
</tr>
<tr>
<td>Gas welding, heavy over 1/2”</td>
<td>6 or 8</td>
</tr>
</tbody>
</table>
DRIVER SAFETY

I. Scope. This policy applies to all drivers of company owned vehicles and drivers of privately owned vehicles used for company business.

II. Driver Responsibilities. All drivers are required to:
   A. Read, understand and follow the requirements of this program.
   B. Participate in any company sponsored activities or programs to improve driver safety.
   C. Maintain a valid driver’s license and adhere to license restrictions.

III. Authorization of Driving Privileges. Employees will not be permitted to operate a motor vehicle for company business if:
   A. The driver does not have a valid driver’s license issued by their state of residence.
   B. The driver possesses more than one driver’s license from more than one state.
   C. The driver’s license has been suspended or revoked for any reason.
   D. The employee has multiple moving violations.

IV. Authorized Vehicle Use.
   A. Company vehicles may not be driven for personal use.
   B. Drivers of assigned vehicles may not allow unauthorized persons to operate company owned vehicles.
   C. Disciplinary action, up to and including termination, may be taken for unauthorized use of company vehicles.
   D. Employees may be held responsible for any losses incurred during an unauthorized use of company vehicles.

V. Driver Motor Vehicle Record (MVR) Checks.
   A. An MVR will be obtained for all new employees.
   B. MVRs will be checked yearly for all drivers.
   C. MVRs will be stored confidentially in each driver’s file
VI. Identification of High Risk Drivers. A driver will be classified as “high risk” for any one of the following violations.
A. Conviction for an alcohol and/or drug related driving offense.
B. Refusal to submit to a Blood Alcohol Content (BAC) test.
C. Conviction for reckless driving.
D. Any combination of three or more moving violations or chargeable vehicle incidents, suspension, revocation, or administrative restriction within the last three years.
E. Leaving the scene of an accident.
F. At fault in a fatal accident.
G. Felony committed involving a vehicle.
H. Two or more damage claims to a company vehicle.
I. Multiple speeding tickets.

VII. Management Controls for High Risk Drivers.
A. Probation. At the discretion of management or the Safety Committee, high-risk drivers may be placed on probation for a period of two years starting from the date of the most recent violation.
   1. Drivers placed on probation will be notified in writing and a copy of the notification will be kept on file.
   2. An MVR will be obtained every six months during the probationary period.
   3. Driving privileges will be immediately suspended for any driving violations during the probationary period.
   4. Additional measures may be taken for probationary drivers including:
      a) Additional driver training.
      b) Loss of company vehicle driving privilege between work and home.
B. Suspension of Driving Privileges. Management or the Safety Committee may elect to suspend all driving privileges of high-risk drivers.
1. Drivers will be notified in writing of any suspension and a copy of the notification will be kept on file.
2. Management or the Safety Committee will determine the length of suspension. The suspension will be for at least a period of three months.
3. After a driver’s driving privileges have been restored, he or she will be placed on probation for a period of two years.

VIII. Reporting Responsibilities.
A. Each driver is to complete a vehicle incident form and report any vehicle incident to the Safety Department per the requirements of the “Incident Reporting and Investigation” section.
B. Drivers are to report to the Safety Department any illness, injury, physical condition, or use of medication that may impair or affect their ability to safely operate a motor vehicle.
C. Drivers are to report to the Safety Department any suspension, revocation, or administrative restriction of his or her operator’s license.
D. Failure to report any of these situations to the Safety Department may result in disciplinary action up to and including termination.

IX. Safety Requirements.
A. Seat Belts. The driver and all occupants are required to wear seat belts when operating or riding in a motor vehicle. The driver is responsible for ensuring that all passengers are wearing seat belts.
B. Impaired Driving. A driver may not operate a motor vehicle at any time when his or her ability is impaired, affected, or influenced by drugs, alcohol, medication, illness, fatigue, or injury.
C. Traffic Laws. Drivers are required to abide by all federal, state, and local motor vehicle regulations, laws and ordinances.
D. Each driver is responsible for ensuring that the motor vehicle is maintained in safe driving condition.
E. Drivers are required to drive with headlights on at all times when conditions warrant.
F. Drivers may not pick up hitch hikers.
G. Drivers may not use radar detectors, laser detectors, or similar devices.
H. Drivers may not push or pull another vehicle without authorization.
I. Drivers may not transport flammable liquids or gases unless a DOT or UL approved container is utilized.
J. Drivers may not use ignition or burning flares. Reflective triangles are preferred.

X. Cell Phone Use.
A. Always give full attention to driving – driving safely is your first responsibility.
B. Pull off the road and park before making or answering a call if driving conditions so require.
C. To avoid interfering with blasting operations, turn your phone OFF when in a “blasting area” or in areas posted “turn off two-way radios”.
D. If you must use your phone in traffic use a hands-free device, if available, so both hands can stay on the wheel.
E. Realize that you will be distracted every time you use the phone. Adjust your driving accordingly – drive slower and increase your following distance.
F. Avoid emotional or complex phone calls. Keep conversations as short as possible.
G. Never take notes or look up phone numbers while driving.
H. Have passengers place and receive calls for you if possible.
I. Check the laws and regulations on the use of wireless telephones in the areas where you drive. Always obey them.
X. Inclement Weather. Always slow down and increase your following distance when driving in inclement weather.

A. Rain.
1. Always turn your lights on in the rain.
2. Slow below posted speed limits on ramps and curves.
3. Slow to a safe speed before curves and accelerate slightly through them. Avoid braking through curves.
4. If you begin to hydroplane do not apply the brakes, let off the gas (depress clutch in manual transmissions) until you slow and the tires regain traction.

B. Snow and Ice.
1. Snow or ice covered roads are more slippery at 32 degrees than they are at zero due to a layer of moisture on top of the snow or ice.
2. Clean all windows, lights and turn signals before driving.
3. Keep windshield wiper fluid full
4. Accelerate, turn, change lanes and stop slowly and smoothly.
5. Signal well in advance for turns, stops and lane changes.
6. Be prepared for a breakdown or getting stuck. Bring warm clothing, boots, flashlight and telephone.
7. If roads appear wet but other vehicles’ tires are not kicking up spray, the roadways may be icy.

C. Fog.
1. If visibility diminishes to a point you must slow to a crawl, find a safe place to pull off the road. Pull as far off the road as possible, do not park on the shoulder where you may be struck.
2. Use low beams.
ELECTRICAL SAFETY PROGRAM

I. Definitions
   A. Arc Rating. The maximum incident energy resistance for a given material. Expressed in cal/cm\(^2\)
   B. Electrically Safe Work Condition. A state in which the circuit or conductor part to be worked on or near has been disconnected from energized parts, locked and tagged, tested to ensure the absence of voltage, and grounded if determined necessary.
   C. Flame-Resistant (FR). A material that will not burn following the application of an ignition source, such as an arc flash.
   D. Flash Hazard. A dangerous release of energy caused by an electric arc.
   E. Incident Energy. The measure of energy released during an electrical arc event. Measured in cal/cm\(^2\)
   F. Hazard Risk Category 2 Clothing and Equipment (HRC 2). HRC 2 clothing consists of a long sleeve shirt and pants, or coveralls, with a minimum arc rating of 8 cal/cm\(^2\), safety glasses, an arc rated face shield, leather gloves, and leather work boots.
   G. Non-Routine Work. Any task listed on the Common Task Charts from NFPA 70E, 2004 Edition (Table 2) as a Hazard/Risk Category task of 2 or higher.
   H. Qualified Person. One who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training on the hazards involved.

II. General Requirements
   A. All electrical conductors and equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees.
B. Listed, labeled, or certified equipment shall be installed and used in accordance with instructions included in the listing, labeling, or certification.

C. Guarding Live Parts. Live parts of electric equipment operating at 50V or more shall be guarded.

D. Ground Fault Protection. All 120V single phase, 15A and 20A receptacle outlets which are not a part of the permanent wiring of the building or structure and are in use by employees shall have approved ground fault circuit interrupters.

III. Temporary Wiring

A. Branch circuits shall originate in a power outlet or panel board.

1. Branch circuit conductors shall be located where they are not subject to physical damage.

2. Branch circuit conductors shall not be laid on the floor.

3. Branch circuit conductors shall be fastened at intervals not exceeding ten feet.

B. Receptacles shall be the grounding type.

C. Receptacles for uses other than temporary lighting shall not be installed on branch circuits that supply temporary lighting.

D. Extension cords shall be the three wire type and be designed for hard or extra-hard usage.

E. Cords for temporary lighting shall be designed for hard or extra-hard usage.

F. Acceptable flexible cord designations include S, ST, SO, STO, SJ, SJO, SJT, SJTO.

G. Flexible cords and cables shall be protected from damage. Sharp corners and edges are to be avoided. Where cords pass through windows or doorways, they must be protected.

H. Temporary lighting shall not be suspended by the cord unless specifically designed to be fastened that way.

I. Light bulbs must be protected from accidental contact or breakage.

IV. Working On or Near Exposed Electrical Conductors
A. Safe Work Condition. Live parts to which an employee may be exposed shall be put into an electrically safe work condition before an employee works on or near them, unless the work on energized components can be justified.

B. Unsafe Work Condition. Only qualified persons are permitted to work on electrical conductors that have not been put into an electrically safe work condition. Other Safety-Related Work Practices shall include:

1. Completing an Energized Electrical Work Permit and holding a Job Briefing
2. Establishing Approach Boundaries for shock and arc flash hazards
3. Use of PPE

V. Establishing an Electrically Safe Work Condition. An electrically safe work condition is only achieved after completing the following six steps:

A. Determine all possible sources of energy by checking up-to-date drawings, diagrams, or identification tags.

B. After properly interrupting the load current, open the disconnect for each circuit.

C. Wherever possible, visually verify that all disconnects are fully open (or that drawout-type circuit breakers are withdrawn to the fully disconnected position).

D. Apply lockout/tagout devices.

E. Use an adequately rated voltage detector to test each phase to verify they are deenergized. Test each conductor phase to phase, and phase to ground. Before and after each test, check that the meter is working properly.

F. Where the possibility of induced voltages or stored electricity exists, ground the phase conductors with ground connecting devices rated for the available fault duty.

VI. Working On or Near Live Parts

A. Justification. Live parts to which an employee might be exposed shall be put into an electrically safe work condition before an employee works on or near them, unless
Deenergizing introduces additional or increased hazards or is infeasible due to equipment design or limitations.

1. Examples of increased or additional hazards include, but are not limited to, interruption of life support equipment, deactivation of emergency alarm systems, and shutdown of hazardous location ventilation equipment.

2. Examples of work that might be worked on or near exposed energized electrical conductors because of infeasibility due to equipment design or operational limitations include performing diagnostics and testing, and work on circuits that form an integral part of a continuous process that would otherwise need to be completely shut down in order to permit the work.

B. Qualified Persons and Crew Compliment. Only Qualified Persons are permitted to perform work on energized equipment.

1. Electricians having completed two years of apprenticeship, or equivalent work experience, are permitted to work on energized systems up to 240V.

2. Only journeyman electricians may work on energized systems over 240V.

3. Any work on energized systems 480V and above requires two qualified persons.

C. Work Permit and Job Briefing. Before starting any non-routine task, the foreman shall complete an Energized Electrical Work Permit and review it in a job briefing with all individuals involved. The briefing shall include:

1. A review of the work plan
2. Electrical hazards associated with the task
3. Specific procedures to be followed
4. Any special precautions
5. Where and how to remove the source of energy
6. Approach boundaries for shock and flash hazards
7. Required PPE for the task
D. Shock Protection Boundaries. Shock protection boundaries must be established, based on system voltage, to minimize the possibility of electric shock to personnel. See Table 1

1. Limited Approach Boundary. An approach limit at a distance from an exposed live part within which a shock hazard exists. Unqualified employees may not enter into a limited approach boundary unless escorted by a qualified employee.

2. Restricted Approach Boundary. An approach limit at a distance from an exposed live part within which there is an increased risk of shock, due to electrical arc over combined with inadvertent movement, for personnel working in close proximity to the part. Only qualified employees may enter a restricted approach boundary.

3. Prohibited Approach Boundary. An approach limit at a distance from an exposed live part within which work is the same as making contact with the live part.

E. Insulated Tools and Equipment. Insulated tools are required when working inside a Limited Approach Boundary when tools or equipment might make accidental contact.

1. Tools shall be rated for the voltages on which they are used.

2. Rubber insulating equipment shall be used to prevent accidental contact with energized conductors. All rubber equipment must be inspected before use. Damaged items shall be removed from service.

3. Only nonconductive portable ladders shall be used.

F. Flash Hazard Analysis. A flash hazard analysis shall be conducted to protect employees from the possibility of being injured in an arc flash. The flash hazard analysis shall determine the flash protection boundary, and the personnel protective equipment necessary within that boundary.

1. For systems operating at 600V or less, a default flash protection boundary of four feet may be used.
2. The flash hazard analysis shall determine appropriate PPE to reduce incident energy exposure to below the threshold for a second degree burn. Acceptable methods for determining the flash protection boundary and PPE requirements include: calculations based on Annex D of NFPA 70E, 2004 Edition, arc flash software, or the common task charts (Table 2).

G. FR Clothing.
1. FR clothing with an adequate arc rating shall be worn for all work on or near energized equipment. Minimum arc rating is determined by the Flash Hazard Analysis.
2. FR Clothing shall always cover all ignitable clothing.
3. Outer layers such as rainwear, jackets, or traffic vests must be FR.
4. Meltable fibers such as acetate, nylon, polyester, polypropylene, and spandex shall not be permitted in fabric underlayers (underwear) next to the skin, other than an incidental amount of elastic in waistbands or socks.
5. FR clothing must cover all exposed skin as completely as possible. Shirts and jackets must be fastened at the wrist and buttoned up to the neck when working on energized equipment.
6. Excessively tight fitting FR clothing should be avoided. Air spaces provide additional thermal insulation.
7. FR clothing must be inspected before every use. Clothing or flash suits that are damaged or contaminated with grease or oil shall not be used.
8. Follow the manufacturer’s instructions for care and maintenance of FR clothing.

H. Arc Flash Protective Equipment.
1. Face Protection. Arc rated face shields shall be worn when working within a flash protection boundary. Safety glasses shall be worn under the face shields.
2. Hand Protection. Leather gloves shall be worn for arc flash protection. When rubber gloves are required for
shock protection, leather protectors shall be worn over the rubber gloves.

I. Signs and Barricades. Signs and/or barricades are required to keep unqualified employees from crossing shock or flash hazard approach boundaries while working on exposed live parts.

1. Signs or barricades shall be established at the Limited Approach Boundary or the Flash Hazard Boundary, whichever is farther from the electrical hazard. Signs and Barricades should never be placed closer than the Limited Approach Boundary.

2. Conductive barricades cannot be used where they might cause an electrical hazard.

3. An attendant may be used in lieu of signs or barricades. The attendant must warn unqualified persons of the electrical hazards and keep them out of the work area. The attendant must remain at the work area until the electrical hazards are no longer present.

4. Signs and barricades should be removed as soon as they are no longer required.

VII. Clear Working Space. A clear working space of approximately three feet must be maintained around any equipment operating at 600V or less and likely to require examination, adjustment, servicing, or maintenance while energized. Code requirements vary for equipment with front, rear, or side access must have clear working space at any access point to live electrical parts.

A. Working spaces cannot be used for storage
Table 1 – Shock Protection Boundaries

<table>
<thead>
<tr>
<th>Nominal System Voltage Range, Phase to Phase</th>
<th>Limited Approach Boundary</th>
<th>Restricted Approach Boundary</th>
<th>Prohibited Approach Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exposed Movable Conductor</td>
<td>Exposed Fixed Circuit Part</td>
<td></td>
</tr>
<tr>
<td>Less than 50</td>
<td>Not specified</td>
<td>Not specified</td>
<td>Not specified</td>
</tr>
<tr>
<td>50 to 300</td>
<td>10’</td>
<td>3’6</td>
<td>Avoid contact</td>
</tr>
<tr>
<td>301 to 750</td>
<td>10’</td>
<td>3’6</td>
<td>1’</td>
</tr>
<tr>
<td>751 to 15kV</td>
<td>10’</td>
<td>5’</td>
<td>2’2</td>
</tr>
<tr>
<td>15.1kV to 36kV</td>
<td>10’</td>
<td>6’</td>
<td>2’7</td>
</tr>
<tr>
<td>36.1kV to 46kV</td>
<td>10’</td>
<td>8’</td>
<td>2’9</td>
</tr>
<tr>
<td>46.1kV to 72.5kV</td>
<td>10’</td>
<td>8’</td>
<td>3’2</td>
</tr>
<tr>
<td>72.6kV to 121kV</td>
<td>10’8</td>
<td>8’</td>
<td>3’3</td>
</tr>
<tr>
<td>138kV to 145kV</td>
<td>11’</td>
<td>10’</td>
<td>3’7</td>
</tr>
<tr>
<td>161kV to 169kV</td>
<td>11’8</td>
<td>11’8</td>
<td>4’</td>
</tr>
<tr>
<td>230kV to 242kV</td>
<td>13’</td>
<td>13’</td>
<td>5’3</td>
</tr>
<tr>
<td>345kV to 362kV</td>
<td>15’4</td>
<td>15’4</td>
<td>8’6</td>
</tr>
<tr>
<td>500kV to 550kV</td>
<td>19’</td>
<td>19’</td>
<td>11’3</td>
</tr>
<tr>
<td>765kV to 800kV</td>
<td>23’9</td>
<td>23’9</td>
<td>14’11</td>
</tr>
</tbody>
</table>
### Table 2 – Common Task Charts (NFPA 70E 2004 Edition)

<table>
<thead>
<tr>
<th>Task (Assumes Equipment Is Energized, and Work Is Done Within the Flash Protection Boundary)</th>
<th>Hazard/Risk Category</th>
<th>V-rated Gloves</th>
<th>V-rated Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panelboards Rated 240 V and Below – Notes 1 and 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circuit breaker (CB) fused switch operation with covers on</td>
<td>0</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>CB or fused switch operation with covers off</td>
<td>0</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Work on energized parts, including voltage testing</td>
<td>1</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Remove/install CB’s or fused switches</td>
<td>1</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Removal of bolted covers (to expose bare, energized parts)</td>
<td>1</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Opening hinged covers (to expose bare, energized parts)</td>
<td>0</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

| **Panelboards or Switchboards Rated>240V and up to 600V (with molded case or insulated case circuit breakers) – Notes 1 and 3** |                       |               |              |
| CB or fused switch operation with covers on | 0                    | N             | N            |
| CB or fused switch operation with covers off | 1                    | N             | N            |
| Work on energized parts, including voltage testing | 2*                   | Y             | Y            |

| **600 V Class Motor Control Centers (MCCs) - Notes 2 (except as indicated) and 3** |                       |               |              |
| CB or fused switch or starter operation with enclosure doors closed | 0                    | N             | N            |
| Reading a panel meter while operating a meter switch | 0                    | N             | N            |
| CB or fused switch or starter operation with enclosure doors open | 1                    | N             | N            |
| Work on energized parts, including voltage testing | 2*                   | Y             | Y            |
| Work on control circuits with energized parts 120V or below, exposed | 0                    | Y             | Y            |
| Work on control circuits with energized parts >120V, exposed | 2*                   | Y             | Y            |
| Insertion or removal of individual starter “buckets” from MCC - Note 4 | 3                    | Y             | Y            |
| Application of safety grounds, after voltage test | 2*                   | Y             | Y            |
| Removal of bolted covers (to expose bare, energized parts) | 2*                   | N             | N            |
| Opening hinged covers (to expose bare, energized parts) – Note 4 | 1                    | N             | N            |

| **600V Class Switchgear (with power circuit breakers or fused switches) – Notes 5 and 6** |                       |               |              |
| CB Operation or fused switch operation with enclosure doors closed | 0                    | N             | N            |
| Reading a panel meter while operating a meter switch | 0                    | N             | N            |
| CB or fused switch operation with enclosure doors open | 1                    | N             | N            |
| Work on energized parts, including voltage testing | 2*                   | Y             | Y            |
| Work on control circuits with energized parts 120V or below, exposed | 0                    | Y             | Y            |
| Work on control circuits with energized parts >120V, exposed | 2*                   | Y             | Y            |
| Insertion or removal (racking) of CBs from cubicles, doors open | 3                    | N             | N            |
| Insertion or removal (racking) of CBs from cubicles, doors closed | 2                    | N             | N            |
| Application of safety grounds, after voltage test | 2*                   | Y             | N            |
| Removal of bolted covers (to expose bare, energized parts) | 3                    | N             | N            |
| Opening hinged covers (to expose bare, energized parts) | 2                    | N             | N            |
### Other 600 V Class (277 V through 600V, nominal) Equipment – Notes 2 (except as indicated) and 3

<table>
<thead>
<tr>
<th>Activity</th>
<th>Y</th>
<th>N</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting or small power transformers (600 V, maximum)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removal or bolted covers (to expose bare, energized parts)</td>
<td>2*</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Opening hinged covers (to expose bare, energized parts)</td>
<td>1</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Work on energized parts, including voltage testing</td>
<td>2*</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Application of safety grounds, after voltage test</td>
<td>2*</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Revenue meters (kW-hour, at primary voltage and current)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insertion or removal</td>
<td>2*</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Cable trough or tray cover removal or installation</td>
<td>1</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Miscellaneous equipment cover removal or installation</td>
<td>1</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Work on energized parts, including voltage testing</td>
<td>2*</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Application of safety grounds, after voltage test</td>
<td>2*</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

### NEMA E2 (fused contactor) Motor Starters, 2.3kV through 7.2kV

<table>
<thead>
<tr>
<th>Activity</th>
<th>Y</th>
<th>N</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contactor operation with enclosure doors closed</td>
<td>0</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Reading a panel meter while operating a meter switch</td>
<td>0</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Contactor operating with enclosure doors open</td>
<td>2*</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Work on energized parts, including voltage testing</td>
<td>3</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Work on control circuits with energized parts 120 V or below exposed</td>
<td>0</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Work on control circuits with energized parts – 120 V, exposed</td>
<td>3</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Insertion or removal (racking) of starters from cubicles, doors open</td>
<td>3</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Insertion or removal (racking) of starters from cubicles, doors closed</td>
<td>2</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Application of safety grounds, after voltage test</td>
<td>3</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Removal of bolted covers (to expose bare, energized parts)</td>
<td>4</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Opening hinged covers (to expose bare, energized parts)</td>
<td>3</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

### Metal Clad Switchgear, 1kV and Above

<table>
<thead>
<tr>
<th>Activity</th>
<th>Y</th>
<th>N</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB or fused switch operation with enclosure doors closed</td>
<td>2</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Reading a panel meter while operating a meter switch</td>
<td>0</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>CB or fused switch operating with enclosure doors open</td>
<td>4</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Work on energized parts, including voltage testing</td>
<td>4</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Work on control circuits with energized parts 120 V or below, exposed</td>
<td>2</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Work on control circuits with energized parts &gt;120 V, exposed</td>
<td>4</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Insertion or removal (racking) of CBs from cubicles, door open</td>
<td>4</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Insertion or removal (racking) of CBs from cubicles, doors closed</td>
<td>2</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Application of safety grounds, after voltage test</td>
<td>4</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Removal of bolted covers (to expose bare, energized parts)</td>
<td>4</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Opening hinged covers (to expose bare, energized parts)</td>
<td>3</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Opening voltage transformer or control power transformer compartments</td>
<td>4</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>
### Other Equipment 1 kV and Above

<table>
<thead>
<tr>
<th>Task</th>
<th>Hazard/Risk Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal clad load interrupter switches, fused or unfused</td>
<td>-</td>
</tr>
<tr>
<td>Switch operation, doors closed</td>
<td>2</td>
</tr>
<tr>
<td>Work on energized parts, including voltage testing</td>
<td>4</td>
</tr>
<tr>
<td>Removal of bolted covers (to expose bare, energized parts)</td>
<td>4</td>
</tr>
<tr>
<td>Opening hinged covers (to expose bare, energized parts)</td>
<td>3</td>
</tr>
<tr>
<td>Outdoor disconnect switch operation (hookstick operated)</td>
<td>3</td>
</tr>
<tr>
<td>Outdoor disconnect switch operation (gang-operated, from grade)</td>
<td>2</td>
</tr>
<tr>
<td>Insulated cable examination, in manhole or other confined space</td>
<td>4</td>
</tr>
<tr>
<td>Insulated cable examination in open area</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: *V-rated Gloves* are gloves rated and tested for the maximum line-to-line voltage upon which work will be done.

*V-rated Tools* are tools rated and tested for the maximum line-to-line voltage upon which work will be done.

2* means that a double-layer switching hood and hearing protection are required for this task in addition to the other Hazard/Risk Category 2 requirements of Table 130.7 (C)(10).

**Notes:**

1. Maximum of 25kA short circuit current available, 0.03 second (2 cycle) fault clearing time.
2. Maximum of 65kA short circuit current available, 0.03 second (2 cycle) fault clearing time.
3. For <10kA short circuit current available, the hazard/risk category required may be reduced by one number.
4. Maximum of 42kA short circuit current available, 0.33 second (20 cycle) fault clearing time.
5. Maximum of 35kA short circuit current available up to 0.5 second (30 Cycle) fault clearing time.
6. For <25kA short circuit current available, the hazard/risk category required may be reduced by one number.
<table>
<thead>
<tr>
<th>Hazard/Risk Category</th>
<th>Clothing Description</th>
<th>Required Minimum Arc Rating of PPE (cal/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Non-melting, flammable materials (i.e. untreated cotton, wool, rayon, or silk, or blends of these materials) with a fabric weight at least 4.5 oz/yd² Safety glasses</td>
<td>N/A</td>
</tr>
<tr>
<td>1</td>
<td>FR shirt and FR pants or FR coverall Hard hat, Safety glasses</td>
<td>(4)</td>
</tr>
<tr>
<td>2</td>
<td>Cotton underwear—conventional short sleeve and brief/shorts, plus FR shirt and FR pants Hard hat, Safety glasses, Arc-rated faceshield, Hearing protection</td>
<td>(8)</td>
</tr>
<tr>
<td>2*</td>
<td>Cotton underwear—conventional short sleeve and brief/shorts, plus FR shirt and FR pants Hard hat, Safety glasses, Arc-rated faceshield with balaclava, Or a double layer switching hood, Hearing protection</td>
<td>(8)</td>
</tr>
<tr>
<td>3</td>
<td>Cotton underwear plus FR shirt and FR pants plus FR coverall, or cotton underwear plus two FR coveralls, Hard hat, Safety glasses, Flash suit hood, Hearing protection</td>
<td>(25)</td>
</tr>
<tr>
<td>4</td>
<td>Cotton underwear plus FR shirt and FR pants plus multilayer flash suit, Hard hat, Safety glasses, Multi layer flash suit jacket and pants, Flash suit hood, Hearing protection</td>
<td>(40)</td>
</tr>
</tbody>
</table>
EMERGENCY ACTION PLANS

I. General. This section provides a general outline for the actions to be followed in emergency situations. The supervisor in charge of each project is responsible for ensuring that the elements of the plan are prepared for and communicated to all employees on site.

II. Elements of all Emergency Action Plans. Each plan must include at least the following considerations:

A. Alerting employees to the emergency. The supervisor in charge of the project must make sure that all employees may be contacted in the event of an emergency. This may be through telephones, two-way radios, air horns, or verbally.

B. Emergency escape procedures, routes and muster points. Make sure building exits are clearly marked and unobstructed. Establish a point, such as the job trailer, where all employees are to muster in the event of an emergency requiring evacuation. Be sure the muster point is not in a location that may obstruct emergency vehicles or place workers in further danger.

C. Accounting for all employees after an evacuation. Each supervisor is responsible for accounting for all employees after an evacuation has been ordered. Any employees unaccounted for must be reported to emergency services personnel.

D. Alerting Emergency Services. In most emergency situations 9-1-1 should be called. Make sure directions to the work site can be given to the 9-1-1 dispatcher.
   1. For remote or large job sites consider having someone meet emergency services personnel and direct them if necessary.
   2. Consider accessibility of the job site. Will police, ambulance or fire trucks be able to access the site?
E. Emergency Response Supplies. Consider what type of emergencies may occur on the job and what type of supplies will be needed. Every job should have PPE and first aid supplies for administering first aid and CPR. Jobs with large amounts of hazardous materials should have spill cleanup supplies.

III. Responding to Emergencies. These steps should be followed in almost all emergencies in addition to the specific procedures listed below.

A. Immediately assess the scene to determine if you or others may still be in danger. Do not respond to any emergency if your own safety is threatened.

B. Stop work if necessary, evacuate employees and account for employees and subcontractors.

C. Call 9-1-1 if Fire, Police, or Emergency Services are required.

D. Contact the Safety Department.

E. Provide First Aid and CPR to any injured employees.

F. Restrict access to the site to any unauthorized personnel including media. Any unauthorized personnel may place themselves in danger and/or obstruct emergency services personnel. Media can contact the main office for statements.

G. Take photographs of the incident scene. Include any property or equipment damage and any conditions that may have contributed to the incident.

H. After the emergency is under control, a thorough investigation is to be completed, including written statements from witnesses, and a report is to be turned in to the Safety Department.

IV. Specific Procedures to Follow in Emergencies.

A. Fire.

1. Small fires may be put out with fire extinguishers by trained personnel.
a) Always position yourself between the fire and an exit.
b) After the fire is extinguished, report the incident to your supervisor and have the extinguisher replaced.

2. Large fires. Sound any fire alarms and notify all workers to evacuate.
   a) Account for all employees and subs.
   b) Call 9-1-1. Have someone direct fire trucks if necessary.
   c) Contact the Safety Department.
   d) Make sure traffic lanes, hydrants and standpipe connections are unobstructed.
   e) Assist firefighters as needed (ex. building layout, flammable/combustible storage areas, etc.)

B. Medical Emergencies.
   1. Call 9-1-1
   2. Provide First Aid and CPR. Use proper PPE to prevent contact with potentially infected blood or bodily fluids.
   3. Do not move any victim unnecessarily to avoid aggravating any injuries.
   4. Assist with EMTs as necessary.
   5. Contact the Safety Department.

C. Utility Damage.
   1. Ensure the safety of all workers.
   2. Contact the PA One Call Service or Miss Utility and notify of the damage.
   3. Contact the Safety Department.
   4. Check the utility location ticket to see if the utility was properly marked. Turn in a copy of the ticket with the incident report.
   5. Photograph the excavation, the damaged line and any markings.

D. Hazardous Substance Spills
   1. If the spill poses an immediate safety, health or environmental hazard, contact local authorities
immediately. Contact the police, local emergency management officials and the Department of Environmental Protection.

2. Contain the spill if possible to prevent the spread of contamination. Dyke or divert spills from entering sewer systems.

3. Contact the Safety Department.

4. Consult the MSDS for additional spill cleanup procedures.

E. Vehicle Incident Report

1. Actions to Take Following a Vehicle Incident:
   a. Check for any injuries of all persons involved in the incident and call for medical assistance as necessary.
   b. Do not attempt to move injured persons except in emergency situations.
   c. Move any damaged vehicles out of roadways if possible and shut down the engine.
   d. Report the incident to the Safety Department and the police as soon as possible.
   e. Protect the scene by activating flashers and setting up reflective triangles if available.
   f. Exchange information with other parties.
   g. Fill out the incident report form completely including a sketch of the scene and names and numbers of witnesses.
   h. Take photos of the scene. Take photos from different angles starting away from the scene and working in closer if this can be done safely. Photograph damage to any vehicles, license plates and/or truck numbers, any property damage, and any potential contributing factors (obstructed road signs, malfunctioning lights, etc.)

2. What Not to do Following a Vehicle Incident.
a. Never admit fault or apologize. Apologizing may be construed as an admission of guilt.
b. Never argue with other drivers or witnesses.
c. Never argue with police.
d. Never make any statements to the media. Refer them to the company.
e. Never discuss details of the incident with anybody other than the police or company representatives.
f. Never agree with other drivers to not report an incident. They may be uninsured or uninspected, the car may be stolen, they may be intoxicated, etc.
g. Never speak to anybody stopping at your home or calling at home about the incident. Refer them to the company.
h. Bring any mail received regarding the incident to the Safety Department as soon as possible.

F. Weather-Related Event.
1. Immediately suspend any work from roofs, scaffolds, ladders or other work at elevations.
2. Make sure all loose materials are secured to prevent flying in the wind.
3. Seek shelter indoors.
4. Listen to a radio weather station for further details and instructions.
5. Contact the Safety Department if there are any damages resulting from the weather event.
TRENCHING AND EXCAVATION

I. General Requirements. This section applies to all open excavations. An excavation is any man-made cut, cavity, trench, or depression in the earth’s surface, formed by earth removal.

A. All surface encumbrances, such as signs, telephone poles, etc., shall be removed or supported prior to excavating adjacent to them.

B. The locations of all utility installations shall be determined prior to excavation. (see APWA temporary marking guidelines- Appendix B)
   1. Mark the proposed dig area with white boundaries and then call the appropriate utility location service.
   2. The utility location service must be contacted between 3 to 10 days prior to excavating. The location service will mark the estimated locations of all underground utilities within the dig area. Protect and preserve the markings. If they are lost, another call must be made to the utility locator.
      a) In PA call PA One Call: 1-800-242-1776
      b) In MD call Miss Utility: 1-800-257-7777
   3. An 18-inch tolerance zone must be maintained on either side of any markings.
   4. Hand dig test pits until the utility is located.
   5. If a line must be exposed, it must be supported and protected while the excavation is open.

C. A means of egress such as a ladder, ramp, stairway or other safe means must be provided in every trench type excavation, four feet or more in depth, within 25 feet of lateral travel for any employee working in the trench.

D. Employees exposed to vehicular traffic shall be protected by the use of highly visible reflectorized vests and any necessary traffic control patterns as determined by the Manual of Uniform Traffic Control Devices or more stringent state requirements.
E. No employees may work underneath loads handled by lifting or excavating equipment. Employees must stay clear of any vehicles being loaded or unloaded.

F. Employees may not work in excavations in which water is accumulating unless additional precautions are taken.

G. The stability of adjacent structures such as walls or buildings must be ensured before excavating adjacent to them. Shoring, bracing or underpinning may be required.

H. All loose rock and soil shall be kept off of the face of excavation walls. Spoils piles shall be kept back at least two feet from the edge of the excavation.

I. Excavations and the surrounding areas must be inspected daily by a competent person to identify hazardous situations such as cave-in, protective system failure, hazardous atmosphere, or other hazardous conditions.

J. Excavations not readily seen because of plant growth or other barriers shall be barricaded. All excavations not back-filled at the end of the shift shall be barricaded.

II. Protective Systems.

A. All employees in excavations must be protected from cave-ins by one of the following methods except when:
   1. The excavation is made entirely in stable rock, or
   2. The excavation is less than 5 feet deep and a competent person determines no indication of a potential cave-in

B. Protective Systems.
   1. Sloping or Benching.
      a) Sloped excavations must be sloped back at an angle not steeper than one and one half horizontal to one vertical (34 degree angle of repose), or
      b) Excavations can be sloped or benched in accordance with Appendix A after a soil classification by a competent person.
   2. Shielding
      a) Shield systems shall be built and used in accordance with the manufacturer’s certification. The certification must be on site while a shield is being used.

15-2
b) Shields may be placed up to two feet from the bottom of the trench as long as there is no indication of soil loss from below the shield.

c) When a combination sloping-shielding system is being used, the excavation must be sloped back to at least 18 inches below the top of the shield.

d) Employees are not allowed in shields when they are being installed, removed, or moved vertically.

e) Shields shall be installed in a manner to prevent lateral movement in the event of a cave-in.

3. Shoring
a) Aluminum hydraulic shoring shall be installed and used in accordance with the manufacturer’s tabulated data. The tab data must be on site while the shoring is being used.

b) Hydraulic shoring is to be set up completely from outside the trench.

4. Design by a Registered Professional Engineer.

a) Any other protective system, or any sloping or benching system in an excavation greater than 20 feet deep shall be designed by a professional registered engineer.

b) The engineered design must be available on site.

III. Soil Classification.

A. Requirements - Classification of soil and rock deposits. Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C.

B. Basis of classification. The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests described in OSHA’s Excavation Standard (Subpart P).

C. Layered systems. In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer (example: Type C over Type B)
### Appendix A – Sloping and Benching

<table>
<thead>
<tr>
<th>Soil or Rock Type</th>
<th>Maximum Allowable Slopes (H:V) (^{[1]}) for Excavations Less Than 20 Feet Deep (^{[3]})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable Rock</td>
<td>Vertical (90 deg.)</td>
</tr>
<tr>
<td>Type A (^{[2]})</td>
<td>(\frac{3}{4} : 1) (53 deg.)</td>
</tr>
<tr>
<td>Type B</td>
<td>(1 : 1) (45 deg.)</td>
</tr>
<tr>
<td>Type C</td>
<td>(1 \frac{1}{2} : 1) (34 deg.)</td>
</tr>
</tbody>
</table>

Notes:

1. Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the Horizontal. Angles have been rounded off.
2. A short term maximum allowable slope of \(\frac{1}{2} H : 1 V\) (63 deg.) is allowable in excavations in Type A soil that are 12 feet or less in depth. Short term maximum allowable slopes for excavations greater than 12 feet in depth shall be \(\frac{3}{4} H : 1 V\) (53 deg.)
3. Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer. (Allowable sloping and benching configurations are included in Attachment 1)

B - 1.1 Excavations made in Type A soil.
1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of \(3/4:1\).

SIMPLE SLOPE – GENERAL
Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of 1/2:1. SIMPLE SLOPE - SHORT TERM

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions as follows:

SIMPLE BENCH

MULTIPLE BENCH
3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3 1/2 feet.

UNSUPPORTED VERTICALLY SIDED LOWER PORTION - MAXIMUM 8 FEET IN DEPTH)
All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3 1/2 feet.

UNSUPPORTED VERTICALLY SIDED LOWER PORTION - MAXIMUM 12 FEET IN DEPTH)
All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of 3/4:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

**SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION)

B - 1.2 Excavations Made in Type B Soil
1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

**SIMPLE SLOPE

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:
3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.
B - 1.3 Excavations Made in Type C Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 1/2:1.

SIMPLE SLOPE

2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1 1/2:1.

VERTICAL SIDED LOWER PORTION
## APWA TEMPORARY MARKING GUIDELINES

<table>
<thead>
<tr>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHITE</td>
<td>Proposed Excavation</td>
</tr>
<tr>
<td>PINK</td>
<td>Temporary Survey Markings</td>
</tr>
<tr>
<td>RED</td>
<td>Electric Power Lines, Cables, Conduit and Lighting Cables</td>
</tr>
<tr>
<td>YELLOW</td>
<td>Gas, Oil, Steam, Petroleum or Gaseous Materials</td>
</tr>
<tr>
<td>ORANGE</td>
<td>Communication, Alarm or Signal Lines, Cables or Conduit</td>
</tr>
<tr>
<td>BLUE</td>
<td>Potable Water</td>
</tr>
<tr>
<td>PURPLE</td>
<td>Reclaimed Water, Irrigation and Slurry Lines</td>
</tr>
<tr>
<td>GREEN</td>
<td>Sewers and Drain Lines</td>
</tr>
</tbody>
</table>

### TYPICAL MARKING

#### LARGE PIPE OR MULTIPLE DUCTS

- **Tolerance Zone:** 18”
- **600mm**
- **24”**

**Example Markings:**
- **TEL**
- **24TEL**

#### SMALL PIPE OR CABLE(S)

- **Tolerance Zone:** 18”
- **2”**

**Example Markings:**
- **WTR**
- **WTR**
GUIDELINES FOR UNIFORM TEMPORARY MARKING OF UNDERGROUND FACILITIES

This marking guide provides for universal use and understanding of the temporary marking of subsurface facilities to prevent accidents and damage or service interruption by contractors, excavators, utility companies, municipalities or any others working on or near underground facilities.

ONE-CALL SYSTEMS
The One-Call damage prevention system shall be contacted prior to excavation.

PROPOSED EXCAVATION
Use white marks to show the location, route or boundary of proposed excavation. Surface marks on roadways do not exceed 1.5" by 18" (40 mm by 450 mm). The facility color and facility owner identity may be added to white flags or stakes.

USE OF TEMPORARY MARKING
Use color-coded surface marks (i.e., paint or chalk) to indicate the location or route of active and out-of-service buried lines. To increase visibility, color coded vertical markers (i.e., stakes or flags) should supplement surface marks. Marks and markers indicate the name, initials or logo of the company that owns or operates the line, and width of the facility if it is greater than 2" (50 mm). Marks placed by other than line owner/operator or its agent indicate the identity of the designating firm. Multiple lines in joint trench are marked in tandem. If the surface over the buried line is to be removed, supplementary offset markings are used. Offset markings are on a uniform alignment and clearly indicate the actual facility is a specific distance away.

TOLERANCE ZONE
Any excavation within the tolerance zone is performed with non-powered hand tools or non-invasive method until the marked facility is exposed. The width of the tolerance zone may be specified in law or code. If not, a tolerance zone including the width of the facility plus 18" (450 mm) measured horizontally from each side of the facility is recommended.

ADOPT UNIFORM COLOR CODE
The American Public Works Association encourages public agencies, utilities, contractors, other associations, manufacturers and all others involved in excavation to adopt the APWA Uniform Color Code, using ANSI standard Z535.1 Safety Colors for temporary marking and facility identification.
FALL PROTECTION PROGRAM

I. Scope. This section outlines the requirements for work performed at heights with the following exceptions:
   A. Requirements relating to fall protection for work on scaffolds are covered under the scaffold section
   B. Requirement relating to fall protection for employees working on stairways and ladders are covered under the stairs and ladders section

II. Fall protection requirements
   A. Unprotected sides or edges. Employees on walking/working surfaces (horizontal and vertical surfaces) with an unprotected side or edge which is six feet or more above a lower level shall be protected from falling by the use of guardrails, safety net systems, or personal fall arrest systems.
   B. Hoist areas. Employees shall be protected from falling six or more feet to lower levels by use of guardrail systems or personal fall arrest systems. If a guardrail system must be removed to facilitate landing material from the hoist, and employees are required to lean out over the opening, personal fall arrest systems shall be used.
   C. Holes. Employees on walking/working surfaces shall be protected from falling through holes (including skylights) more than six feet to a lower level by the use of covers, guardrail systems or personal fall arrest systems.
   D. Ramps runways and other walkways. Employees on ramps, runways and other walkways shall be protected from falling more than six feet to a lower level by the use of guardrail systems.
   E. Wall openings. Employees working at, above or near wall openings with an outside bottom edge greater than six feet from a lower level and the inside lower edge less than thirty nine inches high shall be protected by guardrail systems, safety net systems or personal fall arrest systems.
   F. Excavations. Each employees at the edge of an excavation six feet or more in depth shall be protected from falling by guardrail systems, fences, or barricades when the excavations
are not readily seen because of plant growth or other visual barrier.

G. Roofing work on low slope roofs (less than or equal to a 4 in 12 pitch). Employees engaged in roofing activities on low slope roofs, with unprotected sides and edges six feet or more above lower levels shall be protected from falling by guardrail systems, safety net systems, personal fall arrest system, or a warning line and safety monitoring system.
   1. On low slope roofs fifty feet or less in width, the use of a safety monitor alone is permitted without perimeter warning lines.

H. Walking/working surfaces not otherwise addressed. Employees on any other walking or working surface with a fall potential of greater than six feet shall be protected by guardrail systems, safety net systems or personal fall arrest systems.

III. Protection from falling objects. When employees are exposed to falling objects they shall be protected by one of the following methods in addition to wearing ANSI Z89.1 certified hard hats:
   A. Toeboards and screens shall be used in conjunction with standard guardrail systems to prevent objects from falling from higher levels.
   B. Potential fall objects shall be kept far enough away from the edge of the higher level so that in the event of accidental displacement they would not fall to a lower level.
   C. Areas below higher levels where objects may reasonably be expected to fall shall be barricaded to prevent employees and other personnel from entering these areas.

IV. Fall protection systems criteria.
   A. Guardrail systems
      1. The top edge height of the guardrail system shall be 42 inches plus or minus three inches (39-45 inches).
      2. Midrails shall be installed midway between the top rail and the walking working surface.
      3. Screens and mesh, when used shall extend from the top rail to the walking/working surface and along the entire length of the guardrail.
4. Guardrail systems shall be designed to withstand a force of 200 pounds applied within two inches of the top rail in a downward or sideways direction. The top rail shall not deflect to a height of less than 39 inches when the force is applied in a downward direction.

5. Guardrail systems shall be designed to withstand a force of 150 pounds applied in a downward or sideways direction along any point of the midrail.

6. Toprails and midrails shall be at least one-quarter inch nominal thickness or diameter to prevent cuts or lacerations. If wire rope is used for top rails it shall be flagged at six foot intervals with high visibility material such as caution or danger tape.

B. Safety net systems.
   1. Safety nets shall be installed as close as possible to the walking/working surface and in no case shall they be more than thirty feet below the working surface.
   2. Safety nets shall be installed with sufficient clearance beneath them to prevent contact with any surfaces or structures below when subjected to an impact force equal to that of the drop test specified below.
   3. Safety nets shall be drop tested upon initial installation in accordance with 29CFR1926.502(c)(4).
   4. Safety nets shall be inspected at least weekly for wear, damage, and other deterioration.
   5. Materials, scrap pieces, equipment, and tools which have fallen into the net shall be removed as soon as possible.

C. Personal fall arrest systems.
   1. Personal fall arrest systems shall consist of a full body harness, lanyard and an approved anchorage point
   2. The anchorage point must be capable of supporting at least five thousand pounds or two times the weight of any force imposed on it.
   3. Lanyards shall be attached to the full body harness at the center of the wearer’s shoulder blades.
4. Lanyards shall be rigged to prevent the wearer from falling more than six feet or striking a lower level.
5. Harnesses, lanyards, lifelines and other fall protection devices shall not be used for any purpose other than fall protection.
6. Personal fall arrest systems subjected to impact loading shall be removed from service until it has been inspected by a competent person and determined to be free from damage.

D. Warning Line Systems.
1. The warning line shall be erected around all sides of the roof work area.
2. The warning line shall be erected at least six feet in from the edge of the roof.
3. Warning lines shall consist of ropes, chains, or wire and be erected as follows:
   a) The line shall be flagged at six foot intervals with high visibility material
   b) Stanchions shall hold the line between thirty-four and thirty-nine inches high (including sag).
   c) The line shall be attached to each stanchion so that pulling on one section of the line does not result in taking slack out of another section.
   d) The stanchions must be sturdy enough to resist a sixteen pound tipping force applied at the top of the stanchion after the line has been erected.

E. Safety Monitoring System. Safety monitoring systems and their use shall comply with the following provisions:
1. A competent person shall be designated to monitor the safety of employees on the roof.
2. The monitor is responsible for warning other employees when they seem unaware of fall hazards or are acting in an unsafe manner.
3. The monitor must be on the same walking/working surface as the employees being monitored.
4. The monitor shall be within visual distance and close enough to communicate with employees.
5. The safety monitor can perform no other duties which could take the monitor’s attention from the monitoring function.

F. Covers. Covers for holes in floors, roofs, and other walking/working surfaces shall meet the following requirements:
   1. Covers must be capable of supporting at least two times the weight of any employees, materials, or equipment that may be imposed on them.
   2. Covers must be secured against displacement by wind, equipment, or employees.
   3. Covers must be labeled “Hole” or “Cover”
FIRE PROTECTION AND PREVENTION

I. Portable Fire Fighting Equipment:
   A. For every 3000 square feet of protected building there must be one fire extinguisher rated at least 2A
   B. For multistoried buildings there must be at least one fire extinguisher rated at least 2A on each floor.
      1. There shall be one fire extinguisher located at every stairway used for emergency egress.
   C. Wherever 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas is being used there must be a fire extinguisher rated at least 10B within 50 feet.
   D. Fire extinguishers must be conspicuously located and easily accessible.
   E. Fire extinguishers shall be inspected once a month and maintained in operating condition
      1. Inspection of extinguishers shall include:
         a) Check for accessibility
         b) Check nozzle or horn for obstructions or damage
         c) Examine for corrosion
         d) Check for pin and tamper seal
         e) Check fullness (pressure guage, water level or weight)
         f) Check annual inspection tag.
      2. The inspector should initial the appropriate month on the tag after inspecting the extinguisher.
      3. Any extinguishers not passing inspection should be removed from service and replaced promptly
   F. Every office trailer shall be equipped with at least one fire extinguisher.
   G. Every tool trailer shall be equipped with at least one fire extinguisher.
      1. Trailers with swing doors shall have the fire extinguisher mounted on the inside of the door.
      2. Trailers with roll-up doors shall have the fire extinguisher mounted on the inside wall, so when opened, it is readily accessible.
H. Operation of Extinguishers. All employees should receive training on the use and limitations of different types of fire extinguishers.

II. Fire Alarm Devices
A. An alarm system shall be established to notify employees and local fire officials of an emergency (telephone system, siren, etc.)
B. Entrances and phones shall conspicuously post emergency number and reporting instructions.

III. Ignition Hazards
A. Internal combustion engines shall have their exhaust pointed well away from combustible material.
B. Smoking is prohibited in areas that constitute a fire hazard and shall be posted “No Smoking or Open Flame.”

IV. Flammable and Combustible Liquids
A. Only approved containers and portable tanks shall be used for the storage and handling of flammable and combustible liquids.
   1. Approved safety cans or DOT approved containers shall be used for the handling and storage of 5 gallons or less of any flammable liquid (highly viscid liquids are exempt)
B. Flammable and combustible liquids shall not be stored in any area used for normal passage of employees.

V. Indoor storage of Flammable and Combustible Liquids
A. When in excess of 25 gallons, storage outside of approved storage cabinets is prohibited.
   1. Only approved metal storage cabinets shall be used.
   2. Cabinets shall be conspicuously labeled “Flammable-Keep Fire Away.”
B. Storage of more than 60 gallons of flammable or 120 gallons of combustible liquids is prohibited within any one-storage cabinet.

VI. Fire Control for Flammable or Combustible Liquid Storage
A. Any room used for storage of more than 60 gallons of flammable or combustible liquids shall have a fire
extinguisher, with a rating above 20B, not more than 10 feet outside of door.

B. Any storage of flammable liquids outside must have a fire extinguisher, with a rating above 20B, not less than 25 feet and no more than 75 feet from the storage area.

C. All tanks trucks used for transporting flammable or combustible liquids must have at least one fire extinguisher, with a rating not less than 20B:C, provided on the truck.

VII. Liquefied Petroleum (LP) Gas

A. Welding on LPG containers is prohibited.

B. Temporary heaters should be located at least 6 feet away from LPG containers.

C. Blowers and Radiant type heaters shall not be directed toward any LPG container within 20 feet.

D. Storage

1. Storage of LPG containers inside building is prohibited.

2. Storage of LPG containers outside building as follows:
   a) 500 lbs. or less 0 feet from building
   b) 501 to 6,000 lbs. 10 feet from building
   c) 6,001 to 10,000 lbs. 20 feet from building
   d) Over 10,000 lbs. 25 feet from building

3. Storage location of LPG must have at least one approved fire extinguisher having a rating of not less than 20-B:C.

VIII. Service and Refueling Areas

A. Fueling areas should be located at least 25 feet away from other operations.

B. Flammable or combustible liquids shall be stored in approved aboveground portable tanks.

C. Fuel tanks must be protected against collision damage.

D. Signs shall be conspicuously placed prohibiting smoking and open flames.

E. All motors shall be shut off during fueling.

F. Each area shall have at least one fire extinguisher, with a rating of at least 20B:C, located within 75 feet of each service and fueling area.
G. Drainage: Drainage areas shall terminate in a vacant area, so if the liquid were to ignite it would not further expose any tanks or adjoining property.

H. Dikes must be capable of holding the greatest volume of the largest tank, as if it were full, in the diked area.

IX. Miscellaneous
A. All trash shall be removed at the end of each workday.
B. Trash barrels shall be placed around the site to help contain possible trash fires.
HAND AND POWER TOOLS

I. General.
   A. All tools, whether supplied by I. B. Abel, or an employee’s personal tools, must be maintained in a safe condition.
   B. Power tools equipped with guards must only be used with the guards in place.
   C. Appropriate PPE must be used when power tools prevent hazards from falling, flying, abrasive or splashing objects, or harmful dusts, mists, fumes, vapors or gases.
   D. Any tools which are found to be defective or unsafe must be reported to your supervisor and taken out of service.
   E. Use the proper tool for the job.

II. Hand Tools.
   A. Wrenches shall not be used when the jaws are sprung to the point that slippage occurs.
   B. Impact tools such as drift pins, wedges and chisels shall be kept free of mushroomed heads.
   C. Wooden handles shall be free of splinters and cracks and shall be tight in the tool.

III. Voltage-Rated Tools
   A. Store voltage-tools to minimize the risk of damage to the insulation. Keep away from sources of heat.
   B. Visually inspect voltage-rated tools before use. Replace or repair and test and tools suspected of damage.

IV. Power Tools.
   A. Electric Tools.
      1. Electric power tools shall either be double insulated or grounded.
      2. Tools shall not be unplugged, hoisted, or lowered by their cords.
      3. Tools shall be unplugged from the power source when they are not being used, changing bits, or servicing the tool.
      4. When not in use they should be stored in a dry place.
   B. Pedestal Grinder
      1. Must be anchored to the floor.
2. Wheel guard must be adjusted to within 1/4”.
3. Work rest must be adjusted to within 1/8”.

C. Pneumatic Power Tools.
1. Pneumatic power tools and all airline couplings shall be secured together to prevent them from becoming disconnected.
2. Compressed air shall not be used for cleaning unless reduced to less than 30 p.s.i. Concrete forms may be cleaned with compressed air above this pressure when appropriate eye and face protection are used.
3. Air guns shall never be pointed toward or dead-ended against or towards another individual.

D. Fuel Powered Tools.
1. Fuel powered tools must be shut off when refueling.
2. Fuel powered tools shall not be used in enclosed spaces unless adequate ventilation is supplied.

E. Powder-Actuated Tools.
1. Only licensed operators shall use powder-actuated tools.
2. Powder-Actuated tools shall be tested, used and maintained in accordance with the manufacturer’s recommended procedure.
3. Loaded tools must be used immediately and never left unattended.
4. In the event of a misfire follow these steps:
   a) Wait 30 seconds then try firing again
   b) If it still does not fire, wait an additional 30 seconds before carefully removing the cartridge.

V. Tool guards and safety switches.
A. All guards and safety switches must be installed and in proper working order.
B. Guards shall be provided to protect the operator from:
   1. Point of operation
   2. In-running nip points
   3. Rotating parts
   4. Flying chips and sparks
C. Momentary contact “on-off” switches must be provided on the following hand held-drills, tappers, fastener drivers, grinders, disc and belt sanders, reciprocating saws, saber saws, and other similar tools.
I. General Requirements
   A. Daily/Shift inspections and tests
      1. All machinery and equipment should be inspected before use to ensure safe operating procedures.
      2. Tests shall be performed to ensure that brakes and all other operational systems are in proper working order.
      3. Whenever machinery or equipment is found to have any major deficiencies, it shall be tagged out of service immediately.
         a) Tags shall be placed in a conspicuous location and shall indicate that the equipment shall not be used or the tag shall not be removed. Tags shall only be removed by the person who affixed it, after repairs are completed (refer to the lockout/tagout section of this handbook).
   B. Only qualified individuals shall operate any machinery or equipment.
   C. Equipment and machinery shall not be operated in a manner that will endanger persons or property nor shall the operating speeds or loads be exceeded.
   D. Climb into or out of equipment only using steps or rungs provided on the machine, do not jump out of the cab. Accessing or exiting any piece of moving equipment is prohibited.
   E. Use of mobil phones, headphones, or similar items is strictly prohibited while operating machinery or equipment.

II. Equipment Requirements
   A. Equipment is only designed to carry as many passengers as there are belted seats.
      1. Seat belts are not required for equipment that is designed to be operated in the standing position
      2. Seat belts are not required on those pieces of equipment that is not equipped with ROPS (roll-over protective structure).
3. Mobile equipment to be driven on public roadways shall be properly registered and tagged.
   a) Lights shall be in good working order.
   b) Warning systems, alarms, and horns shall be in good working order.

B. Maintenance and repairs shall only be performed while the equipment is shut off, unless specifically designed for lubricating while the engine is running.

C. Equipment shall have all blades, buckets, dump bodies, or similar equipment fully lowered or blocked when not being used.

D. Clearance around power lines shall be the same as that specified for mobile cranes in the Cranes and Rigging section.

E. Internal combustion engines shall not be run within an enclosed building unless adequate ventilation controls are in place to ensure hazardous atmospheres are not being created.

F. Parking
   1. All parked equipment shall have the parking brake set.
   2. Equipment parked on an incline shall have the wheels chocked and the parking brake set.
   3. Equipment left adjacent to roadways shall have lights or reflectors that are visible to passing motorists.

G. Modifications that affect the unit’s capacities or safe operations shall not be made unless written approval is given by the manufacturer, and proper tags are placed on the unit.

III. Safety Devices

A. All vehicles shall be equipped with an audible warning device accessible from the operator’s station.

B. No equipment having an obstructed view to the rear shall be used unless:
   1. It is equipped with an audible reverse signal that is distinguishable from surround noises or:
   2. The equipment is only back under the direct signaling of a specified spotter.

C. Equipment being used in clearing and demolition operations shall be protected by guards, canopies, or grills.
HOUSEKEEPING - MATERIAL STORAGE

I. General Requirements
   A. All materials stored in tiers shall be stored in a manner which to prevent sliding, falling, or collapse.
   B. Aisles and passageways shall be kept clear to provide safe and adequate movement of materials and employees for general and emergency passage.

II. Material Storage
   A. Materials shall not be stored within 6 feet of any interior floor opening or within 10 feet of any exterior opening unless a barrier capable of supporting the weight of the materials and at least equally as high as the pile is provided.
   B. Materials shall not be stored on scaffolds or runways that are in excess of what is needed for the immediate operation.
   C. Light or loose materials shall not be stored on roof tops or floors unless they are adequately secured or enclosed by a wall.
   D. All stairways and ladder areas shall be kept clear of debris.
   E. Lumber shall have all protruding nails removed, hammered in, or bent flush with the wood face.
   F. Stacking of materials shall be as follows:
      1. Brick stacks shall not exceed 7 feet in height or 4 feet for loose brick unless a taper of at least 2 inches in every foot is provided above 4 feet.
      2. Masonry block stacks shall not exceed 6 feet unless a one half-block taper is provided for every tier above 6 feet.
   D. Propane shall not be stored within an enclosed building.

III. Housekeeping
   A. Job sites and company property shall be kept in a clean orderly fashion
      1. Accumulation of waste materials shall be removed from the site daily and put in proper containers.
      2. Dumpsters should not be overloaded (avoid compacting a full dumpster with equipment to prevent damage).
   B. Job site toilets shall be cleaned on a routine basis.
C. Office trailers and vehicles shall be maintained in a clean orderly fashion to promote the company image.

IV. Disposal of waste materials
   A. Materials that are being dropped 20 feet or more shall be contained with an enclosed debris chute.
   B. When debris is dropped to a lower level the landing area shall be adequately taped off with danger tape and signs shall be posted.
   C. Disposal of waste materials by burning shall be properly permitted and shall follow all local fire regulations.
   D. All oily rags and flammable liquids shall be stored in proper fire resistant containers until removed from the job site.
CONTROL OF HAZARDOUS ENERGY PROGRAM
(LOCKOUT/TAGOUT)

I. Scope. This program covers the servicing or maintenance of machines or equipment in which the unexpected energization or startup of the machines or equipment, or release of stored energy could cause injury to employees. This program establishes minimum performance requirements for the control of such hazardous energy. This section is in addition to the requirements for achieving an electrically safe work condition found in the Electrical Safety section of this manual. This section does not apply to work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or startup of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.

II. Definitions

A. Affected employee. An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

B. Authorized employee. A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee’s duties include servicing or maintenance covered under this program.

C. Energized. Connected to an energy source or containing residual or stored energy.

D. Energy Source. Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other energy.

E. Lockout. The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment
being controlled cannot be operated until the lockout device is removed.

F. Servicing and/or Maintenance. Workplace activities such as constructing installing, setting up, adjusting, inspecting, modifying and maintaining and/or servicing machines and equipment.

G. Tagout. The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

III. Lockout/Tagout Procedures

A. Employees shall ensure that the following procedures for the application of energy control devices have been followed:

1. Preparation for shutdown. Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

2. Machine or equipment shutdown. The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.

3. Machine or equipment isolation. All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner to isolate the machine or equipment from the energy source(s).

4. Lockout or tagout device application
   a) Lockout or tagout devices shall be affixed to each energy isolating device by authorized employees.
      (1) Group lockout procedures may be used when employees are afforded the same level
of protection by that of a personal lockout device.

b) Lockout devices, where used, shall be affixed in a manner that will hold the energy isolating device in a safe or off position.

c) Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the off or safe position is prohibited.

d) Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point the lock would have been attached.

e) Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

5. Stored energy

a) Following the application of the lockout or tagout devices to energy isolating devices, all potentially hazardous energy stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe.

b) If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

6. Verification of isolation. Before starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and deenergization of the machine or equipment have been accomplished.

IV. Release from lockout or tagout. Before lockout or tagout devices are removed and energy is restored to the machine or equipment,
procedures shall be followed and actions taken by the authorized employee(s) to ensure the following:

A. The machine or equipment. The work area shall be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.

B. Employees. The work area shall be checked to ensure that all employees have been safely positioned or removed. Affected employees shall be notified that the lockout or tagout devices are being removed both before and after machines or equipment are energized.

C. Lockout and Tagout Devices. Each lockout or tagout device shall be removed by the employee who applied the device. In situations when that employee is unavailable, the device may be removed by the employee’s supervisor if the following procedures are followed:
   1. It is verified that the employee who applied the device is not at the facility.
   2. The employee is notified that their device has been removed.
   3. It is ensured that the employee has knowledge that their device has been removed before he/she returns to work at that facility.

V. Special Requirements

A. Testing or positioning of machines or equipment. In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following procedures shall be followed:
   1. Clear the machine or equipment of tools
   2. Remove employees from the machine or equipment
   3. Remove the lockout or tagout devices
   4. Energize and proceed with testing or positioning.
   5. Deenergize all systems and reapply energy control measures in accordance with Section III.B of this program to continue the servicing and/or maintenance.
MINE SAFETY

I. Scope. This section applies to all work conducted on mine properties. These rules are specific to work on mine properties and are in addition to the other construction safety and health rules found in this handbook.

II. Training Requirements

A. All employees working on mine site are required to have training meeting the requirements of 30 CFR Part 46.

1. New Miner Training. New miner training consists of twenty-four hours of class room training.
   a) Before a new miner begins work on a mine site at least four hours of training are required. Required topics are listed in the I. B. Abel Part 46 Training Plan.
   b) Training on additional topics, including first aid, is required within sixty calendar days after starting work.
   c) The remainder of the twenty-four hours of training must be completed within ninety calendar days.

2. Annual Refresher Training. Eight hours of annual refresher training are required for each miner.

3. Site Specific Hazard Training. Each mine operator is responsible for providing Site Specific Hazard Training to all employees working on the site. Hazard Training should be completed before working at each new mine site.

B. Records of Training. Each employee receiving training required under part 46 should receive a Certificate of Training – MSHA Form 5000-23

III. Workplace Examinations.

A. A competent person must conduct a daily workplace examination to identify hazardous conditions which may adversely affect safety or health. Hazardous conditions must be corrected promptly.

B. Workplace examinations must be documented and retained.

IV. Equipment Rules.
A. Every piece of equipment must be inspected and written up every day. Defects must be corrected in a timely manner.

B. Every piece of equipment with an enclosed cab must have a fire extinguisher.
   1. Fire extinguishers must be inspected monthly. Inspection tags on extinguishers must be initialed after being inspected.

C. Seat belts are mandatory on all equipment with a cab or ROPS structure.

V. Quarry Rules

A. Berms must be maintained on roadways where a drop off exists of sufficient grade or depth to cause a vehicle to overturn. Berms must be mid-axle height of the largest machine using the roadway.

B. Obey speed limits, stop signs, and traffic signs within the quarry. Many quarries have left hand traffic patterns.

C. Always yield to haul trucks and other larger equipment.

D. Follow all blasting procedures.
   1. Be aware of the blasting schedule and vacate blasting areas to a designated safe area when instructed.
   2. Heed all blast warning signals. Wait for the all clear signal prior to resuming work.

VI. Plant Areas.

A. Any moving machine part within seven feet of a work surface must be guarded to prevent contact with gears, sprockets, chains, tail, head, and take-up pulleys, flywheels, couplings, shafts, and similar moving parts.

B. Housekeeping. Keep all floors, walkways, catwalks, and work platforms free of spilled rock, dust, or other materials that could prevent safe passage.
OSHA/MOSH/MSHA INSPECTIONS

This section contains general information about the inspection process from different regulatory agencies governing worker safety. All employees should be aware of the inspection procedures of these agencies. Work performed in Pennsylvania is governed by the Federal Occupational Safety and Health Administration (OSHA). Work performed in Maryland is governed by the Maryland Occupational Safety and Health (MOSH). Work performed on mine properties is governed by the Mine Safety and Health Administration (MSHA). The inspection procedures of OSHA and MOSH are essentially the same. References to OSHA in this section apply to both agencies. MSHA inspections are slightly different than OSHA. Differences between the agencies are pointed out where appropriate.

What Triggers an Inspection?
OSHA can initiate a job site inspection for various reasons. Inspections are conducted according to the following priority schedule.

1. Imminent Danger. Responding to situations of imminent danger is OSHA’s highest priority. Imminent danger is a situation that is likely to cause death or serious physical harm. If a compliance officer witnesses any situation they consider to be an imminent danger to workers, they have the right to initiate an inspection.
2. Investigations of Fatalities and Catastrophes. Second priority is given to investigations of fatalities and catastrophic accidents.
3. Response to Employee Complaints. OSHA responds to every complaint they receive. Serious allegations may result in on site inspections.
4. Referrals from Other Agencies. Other government agencies may refer OSHA to work sites to investigate worker safety and health conditions.
5. Programmed Inspections. In construction, work sites listed on the Dodge Reports are chosen randomly for programmed inspections.

6. Follow-up Inspections. OSHA has the right to conduct follow-up inspections to verify abatement of previously cited hazards.

MSHA schedules inspections of mine properties in a similar manner but conducts far more inspections. Above ground mines, such as quarries, are inspected at least twice a year in addition to accident and complaint investigations. Long term projects at mine sites are almost guaranteed to be inspected by an MSHA compliance officer.

**Focused Inspection Program**

OSHA’s Focused Inspection Program was created to focus on the major hazards in the construction industry. The program allows limited scope inspections for employers with strong safety and health programs. The program focuses on the four main hazards in construction: fall hazards; electrical hazards; caught in/between hazards (ex. trench collapse); struck by hazards. A focused inspection is usually much quicker than a comprehensive inspection. To qualify for a focused inspection an employer must do two things.

1. Have evidence of a safety and health program that complies with all of OSHA’s General Safety and Health Requirements, and
2. Each project must have a competent person who conducts frequent and regular inspections of the job site. Each supervisor at Abel is considered a competent person and is responsible for conducting inspections of their work areas.
The Inspection Procedure. An inspection can be broken down into three main sections: an opening conference, the walk around portion, and a closing conference.

Opening Conference
Compliance officers will show up on a job site unannounced. Before the inspection begins, the compliance officer will hold an opening conference. Call the Safety Department as soon as it is learned that OSHA is on site. The compliance officer may delay the inspection for a short period until safety representatives arrive. At the start of the opening conference the compliance officer should introduce him/herself and show identification. If one is not offered, ask for a business card. The inspector should state the scope of the inspection and why they are there. If they do not, ask the reason for the inspection. Is the inspection random, a referral, a complaint, etc. Also ask if the inspection will be a focused inspection or comprehensive. If it is not a focused inspection ask why it will not be.

If the inspection is the result of an employee complaint, the inspection should be limited to the scope of the complaint. For example, if a complaint was received about a scaffold without guardrails, that should be all the compliance officer inspects. Be aware however, a compliance officer can cite Abel for any serious violations they witness at any time during any type of inspection. Serious violations may also cause the compliance officer to expand the scope of the inspection to a comprehensive inspection of the entire project.

A representative of each contractor should attend the opening conference. The compliance officer may ask questions about the project and what activities are taking place. He/she may also ask to see some paperwork such as MSDSs or the 300 Log. If the compliance officer asks to see any paperwork that is not available on site the Safety Department can fax or e-mail it to their office.
Walk Around Inspection
A representative of Abel should accompany the inspector during the walk around portion of the inspection. Subcontractor representatives also have the right to attend the walk around inspection. During the inspection, the compliance officer may do any of the following:

1. Inspect the work area for unsafe acts or conditions. They will especially be concentrating on fall hazards, electrical hazards, struck by and caught between type hazards.
2. Ask questions of workers. Questions should be answered truthfully but do not offer any unnecessary information.
3. Interview workers privately.
4. Inspect equipment such as extension cords, backup alarms, scaffolds, etc.
5. Take pictures or video of work activities.

The person accompanying the inspector should take detailed notes of the walk around inspection. If possible, take pictures of anything the compliance officer takes pictures of. Any hazards that are pointed out during the inspection should be corrected immediately. Do not argue with compliance officers, even if you don’t agree with them. It is also not a good idea to stop work altogether while the compliance officer is on site. This will only aggravate the compliance officer and prolong the inspection. Abel employees may not be able to accompany MSHA inspectors during their inspections. Generally they are escorted by a representative of the mine owner and our work sites are only a small part of the overall inspection.

Closing Conference
A closing conference will be held at the end of the walk around inspection. The compliance officer may choose to do this separately with each contractor or together with all representatives at once. At the closing conference the inspector will notify each contractor of their rights and responsibilities after an OSHA
inspection and any citations he/she is going to propose. In an MSHA closing conference, citations will be issued on the spot.

OSHA citations and MSHA assessments are sent in the mail in the days or weeks following an inspection. At that point, the Safety Department can appeal the citations and have them reduced or in some cases withdrawn.

**Top 25 Most Frequently Cited OSHA Standards 2002**

1. General Requirements for Scaffolding
2. Fall Protection
3. Electrical, Wiring Design and Practices
4. Electrical Wiring Methods, Components and Practices
5. Ladders
6. Fall Protection Systems Criteria and Practices
8. Stairways
9. Head Protection
10. Hazard Communication
11. Manually Propelled Mobile Ladder Stands & Scaffolds
12. Fall Protection Training Requirements
13. Electrical, General Requirements
14. Asbestos
15. Concrete/Masonry, General Requirements
16. Construction, Safety Training & Education
17. Excavations, General Requirements
18. Construction, Housekeeping
19. Gas Welding & Cutting
20. Additional Requirements for Specific Scaffolding
21. Lead
22. Material Handling Equipment
23. Training Requirements for all types of Scaffolding
24. Electrical, Safety-Related Work Practices, General
25. Fire Protection
Outside Electrical Safety Policy

I. General Requirements. These rules are in addition to any rules or policies required by 29 CFR 1910 – Electric power generation, transmission, and distribution; 29 CFR 1926 – Subpart V; the NECA/IBEW Safety Rules for the Outside Electrical Industry, or the customer’s safety policy.

A. Electrical equipment and lines shall always be considered to be energized unless they are tested and proven to be deenergized and properly grounded.

B. No worker shall be permitted to approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in the following table, unless:
   1. The worker is insulated from the live part with gloves and sleeves,
   2. The energized part is properly insulated.

<table>
<thead>
<tr>
<th>Voltage Range (phase to phase) Kilovolt</th>
<th>Minimum working and clear hot stick distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 to 1.0</td>
<td>Avoid contact</td>
</tr>
<tr>
<td>1.1 to 15</td>
<td>2 ft. 2 in.</td>
</tr>
<tr>
<td>15.1 to 36</td>
<td>2 ft. 7 in.</td>
</tr>
<tr>
<td>36.1 to 46</td>
<td>2 ft. 10 in.</td>
</tr>
<tr>
<td>46.1 to 72.5</td>
<td>3 ft. 6 in.</td>
</tr>
<tr>
<td>72.6 to 121</td>
<td>4 ft. 3 in.</td>
</tr>
<tr>
<td>138 to 145</td>
<td>4 ft. 11 in.</td>
</tr>
<tr>
<td>161 to 169</td>
<td>5 ft. 8 in.</td>
</tr>
<tr>
<td>230 to 242</td>
<td>7 ft. 6 in.</td>
</tr>
<tr>
<td>345 to 362</td>
<td>12 ft. 6 in.</td>
</tr>
<tr>
<td>500 to 550</td>
<td>18 ft. 1 in.</td>
</tr>
<tr>
<td>765 to 800</td>
<td>26 ft. 0 in.</td>
</tr>
</tbody>
</table>
C. Traffic Control. Any work affecting public traffic must comply with Section 32- Work Zone Safety.
D. Excavation. Any excavation activity must comply with Section 15 – Excavations.
E. Confined Spaces. Any work in underground vaults or manholes must comply with Section 9 – Confined Spaces.
F. Protection of the Public. A ground man or flagger, in addition to any necessary barricades or warning signs, shall be used for the protection of pedestrians when working in public areas.

II. Job Briefing/Hazard Analysis. Following a work site assessment and hazard analysis performed by the crew foreman, the crew shall participate in a job briefing (tailboard). The job briefing shall be conducted by the crew foreman.
A. Job briefings are to be held at the beginning of each shift, at the start of each project within the shift, and after any change in conditions that introduces new or increased hazards.
B. The job briefing shall cover, at a minimum, the following topics:
   1. Hazards associated with the day’s task
   2. Specific work procedures to be followed
   3. Any special precautions that need to be taken such as traffic control
   4. Energy source controls
   5. PPE requirements and daily inspections
   6. Any other information required on the daily briefing sheet including, but not limited to, location of the project and the closest medical facility

III. Emergency Preparedness
A. At least two qualified linemen are required for any work on primary conductors.
B. All linemen shall be trained annually in pole top and bucket rescue.
C. All linemen shall be trained annually in first aid and CPR.

IV. Rubber Protective Equipment
A. Line hose, blankets, gloves, sleeves, and other rubber or synthetic material must be visually inspected before every use. Damaged or defective rubber products must be removed from service and electrically retested.
   1. Gloves are to be air tested each day.
   2. Leather protectors are required over rubber gloves.
B. Rubber gloves are to be dielectrically tested every month. Gloves shall be stamped indicating the most recent test date.
C. Sleeves are to be tested every three months.
D. All other rubber protective equipment is to be tested every year.
E. Rubber protective equipment is to be stored carefully where it will not be subject to damage from tools or other equipment.

V. Flame Resistant (FR) Clothing
   A. FR Clothing with an arc rating of at least 8 cal/cm$^2$ is required for all work on or near energized equipment.
   B. All outer clothing including rain gear, cold weather clothing, and high visibility clothing, must be FR.

VI. Energized Work
   A. Employees shall wear rubber gloves and sleeves at all times, from ground to ground, when working on energized equipment
   B. Employees on the ground shall wear gloves and sleeves in the following situations:
      1. When setting a pole near energized lines
      2. Opening and closing manually operated oil circuit breakers, air break switches, fuses, or fused doors on cutouts.
      3. Testing lines for absence of voltage and applying and removing grounds.
      4. Working on or within reaching distance of any electrical equipment or conductors which are not effectively grounded and which may become energized. (i.e. URD, substations, traffic signals)
C. All energized and grounded conductors, guy wires, or equipment within reach of any part of the body shall be covered, except for the part of the conductor being worked on.

D. Where practical the automatic reclosing feature of the circuit interrupting device shall be made inoperative.

VII. Working on Energized Lines with Live-Line Tools.

A. All live-line tools shall be removed from service and inspected every two years. Defects affecting the dielectric properties of the tool shall be repaired or the tool shall be taken out of service.

B. Lines of #6 copper, #6 ACSR, and #8A copperweld or smaller shall not be worked on with live-line tools except in specific instances where continuity of service is vital, and then only upon special authorization.

C. Planned work with live-line tools shall not be started during unfavorable weather.

D. Under no circumstances shall a lineman depend on another workman to hold a live conductor clear of him.

E. Positive control shall be maintained during the movement of any conductor.

F. While live-line work is in progress, no other work of any nature shall be performed on the same pole or structure.

G. All live-line tools, when not in use, shall be kept in canvas bags or weatherproof boxes provided for that purpose. Containers shall be stored in a dry, and if possible, warm location.

H. All mechanical jumpers must be visually inspected and internal threaded stud terminals checked before every use. Damaged or defective jumpers must be removed from service, repaired, and electrically retested.

I. All mechanical jumpers shall be removed from service and inspected every eighteen months. Defects affecting the safe operating characteristics of the jumper shall be repaired or the jumper shall be taken out of service.
J. When installing or removing jumpers, only one connection shall be made at a time. Jumper ends not connected shall be secured in such a manner as to prevent unintentional contact.

K. Only clean and dry synthetic rope shall be used on energized conductors above 5kV. Link sticks shall be used between the rope and the energized conductor on all voltages.

L. Care shall be exercised to prevent the ends of the tie wires, armor rods, or other conductive material from contacting the structure or attached hardware during removal or installation of energized conductors.

VIII. Deenergized Work.

A. The person receiving the dispatch orders shall record them and read them back to the dispatcher.

B. All conductors shall be treated as energized until tested to be deenergized and grounded.

C. Rubber gloves and sleeves shall be worn while using sticks to test, switch, phase out, or ground circuits and equipment.

D. A Hold Card and lock shall be attached to each switch that is providing clearance on a line.

E. After deenergizing the line and applying hold cards, the foreman shall report back to the dispatcher that the line is out of service and that work may be begun after testing and grounding.

F. Testing equipment of adequate capacity shall be used to determine whether or not a line or equipment is deenergized.

G. Grounding equipment shall be used on all deenergized circuits.

H. Before ordering hold cards removed, the load dispatcher shall require that the same person who received the clearance shall report that the line or equipment may be reenergized.

1. If the foreman who receives a clearance must leave the work before it is completed, he shall notify the dispatcher of the person assuming responsibility for the clearance.
I. If working on a line or other apparatus not under the control of a dispatcher, the request shall be made directly to the person having jurisdiction.

IX. Climbing
A. Before climbing a pole, the pole must be inspected and tested to ensure it is safe to climb and can withstand the additional or unbalanced loads to be applied to it.
B. Poles with wide cracks, shell rot, badly chewed poles, or ice covered poles shall not be climbed.
C. Gaffs shall be well maintained, properly shaped, and sharp. Climbers shall not be worn in buckets, in vehicles, while working on the ground, or any other time they create a hazard.
D. Climbers must be stored where they will not create a hazard or damage other equipment.
E. Employees shall not work on poles before securing themselves with a safety strap.
F. When two or more employees are climbing a pole, one shall reach the work area first before the other begins climbing. Employees shall also descend one at a time.

X. Working on Transformers
A. The primary leads of a distribution transformer shall be considered energized at full voltage until both the primary and secondary leads have been disconnected, or it has been determined that the secondary circuit to which it is attached is not energized from other transformers.
B. The cases of all transformers connected to a source of supply shall be considered as being energized at the full primary voltage unless they are adequately grounded.
C. Employees shall not stand on or otherwise contact transformer cases while working on or near energized circuits.

XI. Working on Capacitors
A. Line capacitors shall be considered at full voltage until they have been disconnected from the line, and the terminals
short-circuited and discharged to ground by an approved method.
B. Employees shall where rubber gloves and use a hot stick while shorting and grounding terminals.
C. Employees shall not come in contact with an ungrounded capacitor case until the capacitor has been disconnected from the circuit and the terminals shorted.
D. The exposed terminals of line capacitors in storage shall be shorted.

XII. Stringing or Removing Conductors
A. Deenergized Conductors
   1. Where there is the possibility of the conductor accidentally contacting an energized conductor, or receiving a dangerous induced voltage buildup, the conductor being installed or removed shall be grounded.
   2. When crossing over energized conductors in excess of 600V, rope nets or guard structures shall be used. In addition, grounds shall be installed on either side of the crossover or considered and worked as energized.

B. Stringing Adjacent to Energized Lines.
   1. Prior to stringing adjacent to energized lines, a competent determination shall be made to ascertain whether dangerous induced voltage buildups will occur.
   2. Tension stringing methods shall be used to prevent unintentional contact between the lines.
   3. All pulling and tensioning equipment shall be isolated, insulated, or effectively grounded.
   4. A traveling ground shall be installed at the tensioning reel during stringing operations.

XIII. Grounding
A. Personal protective grounds shall be applied so as to create a zone of equalized potential for those working on deenergized lines or equipment.
B. New lines and equipment may be considered deenergized and worked as such where:
1. The lines or equipment are grounded, or
2. The hazard of induced voltages is not present and adequate clearances or other means are implemented to prevent contact with energized lines or equipment and the new lines or equipment.

C. Bare wire communication conductors on power poles or structures shall be treated as energized lines unless protected by insulating material.

D. Deenergized lines or equipment that are to be grounded shall first be tested for the presence of voltage.

E. Adequate capacity cables and clamps shall be provided for grounding. They shall be inspected for defects prior to use.

F. Grounds (personal) shall be installed at each work site. A grounding bracket shall be attached to the pole at a point below the work area.

G. Attaching grounds.
   1. When attaching grounds, the ground end shall be attached first, and other end shall be attached and removed by means of insulated tools or rubber gloves.
   2. When removing grounds, the grounding device shall first be removed from the line or equipment using insulated tools or rubber gloves.

H. Where the making of a ground is impractical, or the conditions resulting there from would be more hazardous than working on the lines or equipment without grounding, the grounds may be omitted, and the line or equipment worked as energized.

I. Grounds may be temporarily removed only when necessary for test purposes and extreme caution shall be exercised during the test procedures.

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

K. 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.

L. Grounding equipment shall be of sufficient carrying capacity to actuate protective devices such as oil circuit breakers, relays, etc. without destroying the grounding equipment.

XIV. Poles
A. Poles on trailers must be secured in accordance with the US DOT Federal Motor Carrier Safety Regulations. Ends of poles must be marked with a flag and or red light.
B. Poles stored at their location must be placed so they will not interfere with traffic and protected from rolling. Adequate warning signs shall be posted when necessary to warn motorists and pedestrians of the hazard.
C. When poles are removed the hole must be adequately guarded until it can be backfilled.
D. When setting or removing poles near energized conductors the following safeguards must be followed:
   1. Insulate or deenergize the conductors, or use a pole guard
   2. Employees handling the pole shall use rubber gloves and sleeves.
   3. Employees shall not touch any part of the truck or pole trailer without rubber gloves.
E. Employees shall not pass under a suspended pole.

XV. Underground Lines and Equipment
A. Entering underground structures
   1. Provide all necessary traffic control to protect motor vehicle and pedestrian traffic. If possible, place the truck to protect against oncoming traffic.
   2. All employees working in and around underground structures shall be trained in accordance with the Confined Spaces section of this manual. Appropriate air monitoring shall be conducted and an attendant shall be stationed in the immediate area outside the space.
3. Provide safe access into and out of underground structures. Never step or climb on cables, hangers, or other electrical equipment.

B. Work on Energized Cables
1. All underground conductors above 500V must be deenergized before working on the conductor or before the cables are cut into or spliced.
2. Before working on an energized cable, all other cables and all grounded equipment with which contact can be made shall be covered with rubber blankets or other approved insulation.
3. Because of the characteristics of a low voltage network system, when work is performed on cables or apparatus carrying less than 500 volts, employees shall take extra precautions in the use of necessary protective equipment, in observing necessary clearances and in using proper tools in order to prevent short circuits.
4. Employees shall use rubber gloves and sleeves, and stand on rubber mats or use insulated tools while cutting into and removing sheathing or sleeves and while testing an energized cable.
5. After removing a section of lead sheath or sleeve on an energized cable, the lead on each side of the opening shall be covered with at least nine inches of insulating tape.
6. When cutting an energized multiple conductor cable, a piece of fiber or wood shall be placed between the conductor being cut and the other conductors, and the cut shall be made directly over the shield.
7. Immediately after each conductor of energized multiple conductor cable is cut in two, the ends shall be insulated before another conductor is cut. During the course of the work, only one insulated conductor shall be exposed at any one time.

C. Moving Energized Cables.
1. Cables operating at voltages above 15,000 volts shall not be moved under any circumstances. Cables up to 15,000 volts may be moved at the discretion of the foreman, they shall not, however, be moved where such movement requires changing bends.

2. All cables energized above 500 volts shall be handled with rubber gloves and sleeves.

D. Work on Deenergized Cables

1. Switching and Hold Carding practices described in Section VII shall be followed for all underground systems.

2. When grounding deenergized cable, a zone of equalized potential shall be established to protect all workers working on the line.

3. When a high voltage cable is to be cut, the cable shall be speared at the work location by a remotely operated grounded spear, or a short section of the shielding if any, completely around the cable shall be removed and tests made with two statiscopes or other approved testing devices, to determine whether or not the cable is deenergized.

4. When opening a joint or a splice in a high voltage cable, it shall be speared as in C.3 above, or the sleeve of the joint shall be cut completely around near the wipes and then cut lengthwise and removed from the joint. No effort shall be made to remove the compound. The employee shall then test over each conductor with two statiscopes or other approved testing devices. If no indication of a live cable is obtained, the employee shall remove the compound. If shielding tape is then encountered, it shall be removed and another test made over each conductor. If no indication of a live cable is obtained, the employee shall cut through the joint until the saw touches one of the conductors. Before sawing further, a statiscope test shall be made on the blade of the saw.
5. When cutting or opening joints on low voltage cables, the same procedure shall be followed as for high voltage cables, except in testing. To determine whether the conductor is energized, the insulation shall be cut away to the conductor and tests made with an approved tester. On multiple conductor cables, only one conductor shall be cut into at a time, and tests shall be made on at least two conductors before proceeding with work.

E. When energized pad-mounted transformers are unlocked and opened, they shall be attended at all times. They shall be kept closed and locked at all other times.

XVI. Metal Towers and Structures

A. Work on steel towers shall comply with Section 29 – Steel Erection, including fall protection requirements.

B. Tower assembly shall be carried out with the minimum number of employees exposed to falling objects when working at heights.

C. No one shall be permitted under suspended sections except as necessary to guide and secure the section being set.

D. Tag lines shall be used to maintain control of pieces being set unless their use creates a greater hazard.

E. A designated employee shall be used to determine that the required clearances are maintained when moving equipment or tower sections near energized lines.
PERSONAL PROTECTIVE EQUIPMENT

I. Scope.
   A. Personal protective equipment (PPE) for eyes, face, head and extremities, protective clothing and respiratory protection shall be provided, used and maintained in a sanitary and reliable condition whenever it is necessary to protect employees from the hazards presented by processes or environment, chemical hazards, radiological hazards or mechanical hazards encountered on the various job sites.
   B. Abel shall provide all necessary PPE at no cost to employees with the exception of safety toe shoes and prescription safety glasses.
   C. Where employees provide their own protective equipment, Abel shall assure the adequacy of the equipment including proper maintenance and sanitation of the equipment.
   D. Training shall be provided on the proper use, maintenance, inspection, and limitations of all required PPE.

II. Head Protection.
   A. Hard hats must meet the specifications contained in American National Standards Institute Z89.1-1969 Safety Requirements for Industrial Head Protection.
   B. Hard hats shall be kept in good repair and worn in accordance with the manufacturer’s recommendations.
   C. Hardhats are to be worn in the following situations:
      1. When there is possible danger of head injury from impact, or from falling or flying objects.
      2. When there is the possible of shock or electrical burns.
      3. When required by the customer.

III. Eye and Face Protection.
   A. Employees are required to wear eye protection while working in the field at all times.
   B. Eye and face protection shall meet the specifications contained in American National Standards Institute Z87.1-1968 Practice for Occupational and Educational Eye and Face Protection.
C. Employees whose vision requires the use of corrective lenses shall be supplied with goggles or glasses that can be worn over the corrective lenses.

IV. Foot Protection
   A. Employees are required to wear leather over-the-ankle work boots.
   B. Safety-Toe boots may be required by customer. Safety-Toe work boots shall comply with the American National Standard for Men’s Safety-Toe Footwear, Z41.1-1967.

V. Hearing Protection
   A. Employees are required to use hearing protection devices when they are exposed to excessive noise levels (see the Hearing Loss Prevention section).

VI. Hand Protection
   A. Appropriate gloves are to be worn when equipment or materials present a burn, cut, puncture, electrical, or chemical hazard.

VII. Clothing
   A. Employees are required to wear full length work pants and shirts with at least a three inch sleeve. Half or three-quarter length shirts are not permitted.
   B. Excessively loose or baggy clothing is not permitted.
   C. Excessively worn or ragged clothing or clothing with large holes is not permitted.
Radio Frequency (RF) Radiation

I. Definitions
A. Radio Frequency (RF). Radio waves and microwaves with frequencies on the electromagnetic spectrum between 3 kilohertz and 300 gigahertz
B. Maximum Permissible Exposure (MPE). The threshold level established by the Federal Communications Commission (FCC) at which harmful biological effects may occur. MPE is frequency dependent and is defined in terms of field strength and in terms of power density (see Table 1).
C. General Population/Uncontrolled Limits. RF exposure to the general public or workers who may not be fully aware of their exposure or who cannot exercise control over their exposure.
D. Occupational/Controlled Limits. RF exposure to workers who are fully aware of their exposure and can exercise control over their exposure.

II. Health Hazards of RF Radiation
A. The main effect of exposure to RF radiation is heating of body tissues.
   1. Prolonged exposure can result in an increase in body temperature.
   2. Localized heating (hot spots) can cause tissue burns. Organs with poor heat control are most susceptible (eyes and testes)
B. Shocks and burns can result from direct contact or arcs from RF transmitters.
C. Reports on other biological effects from RF exposure (i.e. cancer, reproductive effects) have so far been inconclusive.

III. Initial Environmental Evaluation and Exposure Assessments.
Prior to accessing towers, rooftops, or other transmitting sites, contact the site or building owner for information on RF exposure.
A. FCC regulations require licensed transmitting facilities and operations to conduct an initial environmental evaluation.
B. If this evaluation indicates possible exposures above the FCC limits, an exposure assessment must be conducted.
C. Some RF sources that offer little potential for causing exposures in excess of the limits are considered “categorically excluded” and are not required to perform these valuations.

IV. Protection from Radio Frequency Exposure
A. Employees shall not enter areas where RF exposure levels are above the general population/uncontrolled MPE without proper training or appropriate control measures.
B. Before employees work in areas on a communication tower where RF exposure levels exceed the occupational/controlled MPE values, one of the following control measures shall be instituted:
   1. Reduce the transmitter power to a level that ensures RF exposure levels in the areas to be worked will be below the occupational/controlled MPE. If power reduction is used as a control measure, a competent person shall lock and tag the transmitter at the reduced level. Ensure that any remote operation of the transmitter is properly disabled.
   2. If the transmitter power level cannot be reduced and maintained at a level below the occupational/controlled MPE, the transmitter shall be locked and tagged out in accordance with procedures in the Control of Hazardous Energy section of this manual. Ensure that any remote operation of the transmitter is properly disabled.
   3. If the transmitter power level cannot be reduced or locked and tagged out, other administrative controls shall be employed.
C. Administrative Controls
   1. Personal Monitoring. Personal RF monitors should be worn by climbers likely to exceed the MPE, or when
exposure levels are not known. Employees must leave the area promptly when alerted by the device.

2. Time Limits. Occupational exposures are based on a six minute time weighted average. It is possible to exceed the MPE briefly, as long as the average exposure over six minutes is below the MPE (i.e. a worker can be exposed to two times the MPE for three minutes in any given six minute period, as long as there is no exposure for the three minutes before or after).

3. RF Protective Clothing. RF protective clothing can be worn to protect against RF exposure. RF protective clothing requires specialized training and may only be used for the RF field intensity and frequency range it was designed for.

V. Training. Anyone working in areas above occupational/controlled limits should receive periodic training on RF radiation. Training should include:
   A. Hazards of RF radiation
   B. Monitoring equipment
   C. Personal protective equipment
   D. Exposure control measures
Table 1. *FCC Limits for Maximum Permissible Exposure (MPE)*
(A) Limits for Occupational/Controlled Exposure

<table>
<thead>
<tr>
<th>Frequency Range (MHz)</th>
<th>Electric Field Strength (E) (V/m)</th>
<th>Magnetic Field Strength (H) (A/m)</th>
<th>Power Density (S) (mW/cm²)</th>
<th>Averaging Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3-3.0</td>
<td>614</td>
<td>1.63</td>
<td>(100)*</td>
<td>6</td>
</tr>
<tr>
<td>3.0-30</td>
<td>1842/f</td>
<td>4.89/f</td>
<td>(900/f²)*</td>
<td>6</td>
</tr>
<tr>
<td>30-300</td>
<td>61.4</td>
<td>0.163</td>
<td>1.0</td>
<td>6</td>
</tr>
<tr>
<td>300-1500</td>
<td>--</td>
<td>--</td>
<td>f/300</td>
<td>6</td>
</tr>
<tr>
<td>1500-100,000</td>
<td>--</td>
<td>--</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

(B) Limits for General Population/Uncontrolled Exposure

<table>
<thead>
<tr>
<th>Frequency Range (MHz)</th>
<th>Electric Field Strength (E) (V/m)</th>
<th>Magnetic Field Strength (H) (A/m)</th>
<th>Power Density (S) (mW/cm²)</th>
<th>Averaging Time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3-1.34</td>
<td>614</td>
<td>1.63</td>
<td>(100)*</td>
<td>30</td>
</tr>
<tr>
<td>1.34-30</td>
<td>824/f</td>
<td>2.19/f</td>
<td>(180/f²)*</td>
<td>30</td>
</tr>
<tr>
<td>30-300</td>
<td>27.5</td>
<td>0.073</td>
<td>0.2</td>
<td>30</td>
</tr>
<tr>
<td>300-1500</td>
<td>--</td>
<td>--</td>
<td>f/1500</td>
<td>30</td>
</tr>
<tr>
<td>1500-100,000</td>
<td>--</td>
<td>--</td>
<td>1.0</td>
<td>30</td>
</tr>
</tbody>
</table>

*f* = frequency in MHz *Plane-wave equivalent power density*
Railroad Safety

I. Scope. These rules apply to any work on or near railroad tracks with the potential for fouling the track.

II. Definitions

A. Flagman. An employee designated by the railroad to direct or restrict the movement of trains past set points on a track to provide on-track safety for roadway workers.

B. Fouling a Track. When an individual or equipment is positioned so that they may be struck by a moving train or on-track equipment, or is within 4 feet of the track.

C. Job Briefing. A meeting to communicate the activities happening throughout the day while working on railway property.

D. On-Track Protection. A way to prevent roadway workers from being struck by a moving train or other equipment.

E. Place of Safety. A designated safe location at least thirty feet from the tracks for workers to retreat to when notified by a flagman or watchman. Workers must be able to get to the place of safety at least fifteen seconds before any train passes the work location.

F. Train Approach Warning. A method of establishing on-track safety by warning roadway workers of the approach of trains in ample time for them to move to or remain in a place of safety in accordance with the requirements of this part.

G. Watchman/Lookout. An employee who has been trained and qualified to provide warning to roadway workers of approaching trains or on-track equipment.

H. Working Limits. A segment of track established in accordance with the railroad owner where trains and engines may move only as authorized by the flagman having control over that segment of track.

III. Training. Rail systems are controlled by the Federal Railroad Administration (FRA). The FRA mandates that rail system owners provide training to all workers on or near tracks with the potential to...
interfere with or be struck by railway traffic. Each railway has their own training requirements.

A. Training shall include, at a minimum:
   1. Recognition of railroad tracks and understanding of the space around them within which on-track safety is required.
   2. The functions and responsibilities of various persons involved with on-track safety procedures.
   3. Proper compliance with on-track safety instructions given by persons performing or responsible for on-track safety functions.
   4. Signals given by watchmen/lookouts, and the proper procedures upon receiving a train approach warning from a lookout.
   5. The hazards associated with working on or near railroad tracks, including review of on-track safety rules and procedures.

IV. Job Briefing
   A. A job briefing must be held with all individuals on the project. Briefings must be held:
      1. Before work commences on railroad property each day
      2. Whenever work conditions or activities have changed
   B. The following topics shall be covered:
      1. Who is responsible for On-Track protection?
      2. Which type of On-Track protection is in use?
      3. Is this protection appropriate?
      4. Will other machines or personnel be involved?
      5. Which type of on track safety is provided on adjacent tracks?
      6. Where is the designated place of safety?
      7. What are the track limits?
      8. When do these limits expire?
      9. Where can I find a copy of the On-Track Protection rules?
     10. Do I understand all of the aspects of my On-Track protection?
V. On-Track Protection. There are three types of on-track protection: Working Limits; Train Approach Warning; and Individual Train Detection. The method of On-Track Protection to be used is determined by the railway.

A. Working Limits.
   1. A flagman creates set boundaries and time limits for the work.
   2. Trains may only proceed within the boundaries after the flagman clears the tracks of contractors and equipment, and signals the train through.
   3. Working limits are used when occupying or fouling track with equipment
   4. Only the flagman can set these boundaries
   5. Always obey the flagman.

B. Train Approach Warning. Uses a watchman/lookout to warn of approaching trains.
   1. A watchman/lookout cannot do anything but monitor for trains and warn employees.
   2. The watchman/lookout warns workers when a train is approaching to vacate tracks in time to a place of safety.
   3. The watchman/lookout uses a whistle and white flag to warn employees.

C. Individual Train Detection
   1. Used for lone worker
   2. Relies on the conditions that the worker can see and hear an oncoming train
   3. Must have visibility enough to leave the track in time
   4. Cannot use power tools
   5. Must complete a Statement of On-Track Safety Form.
SCAFFOLDS

I. Platform Construction
   A. Each working level must be fully planked or decked.
   B. Scaffold platforms must be within fourteen inches of the work surface.
   C. Eight foot scaffold planks must extend over their support at least six inches but less than twelve inches unless secured to prevent movement.
   D. Sixteen foot scaffold planks must extend over their support at least six inches but less than eighteen inches unless secured to prevent movement.
   E. Where planks are overlapped, the overlap must be a minimum of twelve inches and must occur over a support.
   F. Scaffold planks should not be painted or coated with anything to make them slippery or which could cover up defects such as cracks.

II. Supported Scaffolds
   A. Scaffolds must be built on a firm foundation. Scaffolds built on the ground require baseplates and mudsills.
   B. Unstable objects such as masonry blocks may not be used to support scaffolds
   C. Scaffolds frames must be plumb and platforms must be level.
   D. Scaffolds over four times higher than their width must be secured to prevent tipping (usually three bucks high on a walk-through frame scaffold).
      1. Scaffolds must be secured at both ends and every thirty feet counting from one end. Scaffolds must be secured vertically every twenty feet thereafter

III. Access.
   A. When scaffold platforms are more than two feet above or below a point of access, a ladder or some other safe means is required to access the scaffold.
   B. X-braces may not be used to access scaffolds.
   C. Walk-through frames may not be climbed as ladders to access the scaffold (Note: Laborers erecting and dismantling the
scaffold may climb walk-through frames, but they may not climb the x-braces)

IV. Fall Protection on Scaffolds

A. Fall protection is required for any scaffold over ten feet high.
B. Laborers erecting or dismantling scaffolds may work at heights over ten feet without fall protection if a competent person determines that it is not feasible or creates a greater hazard to use fall protection.

C. Guardrail Systems. The following requirements apply to guardrail systems used on scaffolds
   1. Guardrail systems are required on all open ends and sides of scaffolds.
   2. The guardrail shall consist of a toprail thirty-eight to forty-five inches high and must be capable of supporting two hundred pounds.
   3. The midrail should be approximately midway between the toprail and the platform and must be capable of supporting one hundred-fifty pounds.
   4. X-braces may be used in place of a midrail if the crossing point of the brace is between twenty and thirty inches high. X-braces may be used in place of a toprail if the crossing point of the brace is between thirty-eight and forty-eight inches high. The end points of the x-brace may not be more than forty-eight inches apart for it to count as a toprail or midrail.

D. Personal Fall Arrest Systems (Harnesses)
   1. Personal fall arrest systems used on scaffolds must comply with the Fall Protection section of this manual.
   2. Harnesses should be connected to vertical lifelines, horizontal lifelines, or structural members. Connection to the scaffold components is not acceptable in most situations.

V. Falling Object Protection

A. Toeboards are required on all platforms where work is being performed or material is stored.
B. Platforms shall only be loaded with the materials needed for immediate use.
C. Debris such as masonry pieces shall not be allowed to accumulate on scaffolds.

VI. Use of Scaffolds. Use of scaffolds must comply to the following rules:
A. Scaffolds must be erected, moved, dismantled or altered only under the supervision and direction of a competent person.
B. Clearance between scaffolds and power lines shall be the same requirement as for cranes and other equipment (ten feet for power lines up to 50kV).
C. No work may be performed from snow or ice covered platforms (except for removal of the snow and ice).
D. Makeshift devices such as boxes or buckets may not be used for additional reach on scaffolds.
E. Ladders may not be used on scaffold platforms for additional reach (except on large area platforms).
F. Scaffold frames must be secured together vertically with coupling pins or an equivalent.
G. Outrigger brackets shall be used for personnel only.
H. Scaffold casters must be locked when the scaffold is occupied.
I. Mobile scaffolds may not be moved while occupied unless the floor is roughly level and free of pits, holes and obstructions; and the scaffold is no higher than two times it’s width.

VII. Aerial Lifts.
A. Fall Protection. Personal fall arrest systems are required in addition to full guardrails on boom lifts. (NOTE – some manufacturers of platform lifts are now installing lanyard attachments and recommending tying off in platform lifts. It is I. B. Abel’s policy to abide by all manufacturer recommendations)
B. Tying off to structures other than the provided attachment points is not permitted.
C. Lifts must be inspected daily prior to use.
D. Only authorized employees should operate lifts.
E. Employees must stand on the floor of the lift at all times. Standing on the rails or other objects to gain reach is not permitted.
F. Weight capacities and personnel limits must not be exceeded.
G. Lifts shall not be used for any purpose they were not designed for. Aerial lifts may be field modified for uses other than those intended by the manufacturer only if the modification is certified in writing by the manufacturer.

H. Follow all other safety requirements found in the operator’s manual located on the unit.
STAIRS AND LADDERS

I. General Requirements
A. A stairway or ladder is required at any point of access where there is a break in elevation greater than nineteen inches and no ramp, runway, sloped embankment or other means of access is provided.
B. Stairway, ladders and their landings must be kept clear at all times.
C. If a stairway or ladder has to be blocked, another means of access must first be provided.

II. Stairways
A. Riser heights and tread depths must be uniform within each flight of stairs.
B. Where doors or gates open onto a stairway, a landing must be provided. The landing must be at least 20 inches wider than the swing of the door.
C. Metal pan stairs may not be used unless the treads are filled in permanently or temporarily. Temporary treads in pan stairs must be solid and fill the full width and length of the tread.
D. Stairrails are required on any open side of a stairway having four or more risers or higher than thirty inches. A stair rail consists of a top rail and mid rail.
   1. Stair rail height should be thirty-six inches measured from the front of the tread.
   2. Mid rail height is midway between the top rail and the stair surface.
   3. A handrail is required on at least one side of the stairway. A stairrail may also serve as a handrail as long as it is surfaced to prevent injury from punctures or lacerations, and to prevent snagging of clothing.
   4. Stairrails must support at least 200 pounds.
   5. Stair landings must be protected with standard guardrails as described in the fall protection section.

III. Ladders
A. General Ladder Safety
1. Ladders must be kept free of oil, grease and other slippery substances.
2. Precautions must be taken when ladders are placed in doorways, passageways or aisles where they can be displaced by workers or activities in the area.
3. Ladders should not be moved or adjusted while occupied.
4. Conductive (aluminum) ladders cannot be used where the ladder or the employee could contact electrical equipment.
5. Ladders must be inspected frequently. Report any defects to your supervisor. The supervisor is responsible for removing from service any ladder that is not safe for use.
6. When climbing a ladder, the user must face the ladder.
7. At least one hand must be completely free to grasp the ladder when climbing. No tools or equipment are to be carried up or down a ladder that could cause any employee to lose balance and fall.
8. Use a hoist line to raise or lower larger objects at ladder ways.

B. Step Ladders
1. Stepladders may only be used in the open position. A metal spreader or locking device is required to hold the ladder in the open position.
2. The top and the last step of stepladders may not be used as a step.
3. Cross bracing on the back of a stepladder may not be climbed.

C. Straight/Extension Ladders
1. When extension ladders are used to gain access to another level, the ladder must extend three feet above the upper landing surface.
2. The base of a straight ladder should be set up approximately one-quarter of the working height of the ladder away from the support (for example, the base of a ladder used to get on a twelve foot roof should be four feet from the building). A rule of thumb – If you place your feet at the bottom of the feet of the ladder, your arms should extend straight out to the side rails of the ladder.
3. Straight ladders must have slip resistant feet. Ladders set up on slippery surfaces must be tied off at the top or bottom to prevent the ladder from kicking out.
4. Ladders used to access another level must be tied off at the top.
5. The rails of a straight ladder must be supported equally unless it is equipped with a single support attachment.
6. Ladders must be used on stable and level surfaces unless they are properly secured.
STEEL ERECTION

I. Start-Up. Before steel erection may begin on any project, the steel crew foreman must ensure the following information has been provided:

A. Written notification that the concrete in the footings, piers and walls and the mortar in the masonry piers and walls has attained sufficient strength to support the loads imposed during steel erection.

B. Any repairs, replacements or modifications to the anchor bolts were approved by the project engineer.

II. Hoisting and Rigging

A. Hoist Equipment Inspections. All hoisting equipment must be inspected by a competent person prior to every shift. Any defects affecting the safety of the equipment shall be corrected before the equipment is used.

B. Rigging equipment must be inspected by a qualified rigger prior to every shift.

C. Riding of the headache ball is strictly prohibited

D. Employees may be transported in a manbasket if all of the conditions of the CRANES section are met.

E. Multiple Lifts (Christmas Treeing). Christmas treeing is permissible under the following conditions:

1. A multiple lift rigging assembly is used.

2. Only beams and similar structural members are lifted.

3. Five members may be rigged at one time, approximately level, and at least seven feet apart from each other.

III. Column Anchorage.

A. All columns shall be anchored by a minimum of four anchor bolts.

B. Repairs, replacements or alterations to anchor bolts must be approved by the project engineer.

IV. Beams and Columns.
A. When connecting solid web structural members, the hoist line shall not be released until two bolts per connection are made and drawn up wrench tight.

B. Rigid members in pre-engineered buildings require 50% of their bolts, wrench tight, before releasing the hoist line.

C. Diagonal bracing requires one bolt per connection, wrench tight, before releasing the hoist line.

D. Double connections at columns require a seat under the first beam, bolted or welded to the column and the beam, or an “OSHA connection”

V. Bar Joists

A. Bar joists at columns, not framed in at least two directions, must be stabilized to prevent lateral movement of the columns, and rotation of the bar joist.

B. When joists are landed on a structure they shall be secured to prevent accidental displacement.

C. Attachment of Bar Joists

1. Each joist shall be attached at least at one end on both sides of the seat immediately upon placement in the final erection position and before additional joists are placed.

2. Each end of "K" series steel joists shall be attached to the support structure with a minimum of two $\frac{1}{8}$-inch fillet welds 1 inch long or with two $\frac{1}{2}$-inch bolts, or the equivalent.

3. Each end of "LH" and "DLH" series steel joists and steel joist girders shall be attached to the support structure with a minimum of two $\frac{1}{4}$-inch fillet welds 2 inches long, or with two $\frac{3}{4}$-inch bolts, or the equivalent.

D. Erection of Bar Joists

1. For bar joists requiring erection bridging per the attached OSHA Tables A and B, both sides of the
seat of one end shall be attached before the hoist line is released.

2. For joists over 60 feet, both ends of the joist shall be attached before the hoist line is released.

3. For bar joists that do not require erection bridging, only one employee may be on the joist until all bridging is installed and anchored.

E. Erection Bridging

1. Where the span of the steel joist is equal to or greater than the span shown in OSHA’s bar joist Tables A and B (Steel Foreman shall obtain a copy of the bar joist tables from the Safety Department.), the following shall apply:
   a) A row of bolted diagonal bridging shall be installed near the midspan before the hoist line is released.
   b) For joists over 60 feet, both ends shall be attached before releasing the hoist line.
   c) No more than one employee shall be allowed on any bar joist until all bridging is installed and anchored. No more than two employees shall be allowed on any bar joist over 60 feet through 144 feet, until all bridging is installed.
   d) No construction loads are allowed on steel joists until all bridging is installed and anchored and all joist-bearing ends are attached.

VI. Fall Protection.

A. Falling Objects

1. All materials, equipment, and tools not in use must be secured to prevent accidental displacement.
2. No other trades may work below steel erection activities unless adequate overhead protection is provided.

B. Ironworkers engaged in steel erection more than six feet above a lower level require fall protection.
   1. The fall protection requirements for steel erection performed on multi-story buildings and some pre-engineered buildings may exceed six feet if approved by the Safety Department. In this case a pre-erection meeting must be held and an approved fall protection plan developed and documented. Under no circumstances will the fall protection requirements exceed regulatory requirements.

C. On multi-story buildings, perimeter safety cables must be installed as soon as the metal decking has been laid.
TOWER CLIMBING AND ERECTION

I. Tower Inspections
   A. All structures to be climbed must be inspected per the guidelines outlined in EIA/TIA-222-G Annex E: *Tower Maintenance and Inspection Procedures*.
   B. New structures shall be inspected initially. Guyed towers should be inspected within three years; self-supporting towers should be inspected within five years.
   C. If a tower owner has not kept current inspection and maintenance information on a tower to be climbed; the Project Manager shall make arrangements for prompt inspection by an experienced, competent inspector.
   D. These initial and periodic inspections do not replace the daily pre-climb inspections required by this policy.

II. Competent Tower Climbers
   A. Only authorized Competent Tower Climbers may perform work at elevated heights.
   B. Authorized Tower Climbers must successfully complete a tower climbing course and participate in annual tower rescue drills.
      1. The tower climbing course will be based on the Tower Climbing Safety and Rescue Basic Course provided by ComTrain LLC, or an equivalent.

III. No Free Climbing Policy
   A. I. B. Abel adheres to a strict No Free Climbing policy. All work on towers will be done utilizing 100% fall protection techniques.
   B. Any climber not in compliance with this policy will be subject to disciplinary action up to and including removal from the project.

IV. Climbing Equipment
   A. Each climber will be outfitted with a full body harness, twin leg lanyard, safety, safe climb attachment device, rope grabs, descenders, and any other equipment necessary for fall protection, positioning, controlled descent and rescue.
B. All climbing equipment will be visually inspected before each use. Damaged or defective equipment will be immediately destroyed or tagged out of service.
C. Equipment will be inspected by a competent person, other than the user, at least annually.

V. Prior to Climbing
A. Inspect the tower from the ground for hazardous conditions. Using binoculars, check for obvious structural damage, missing members, corrosion, birds nests, insects, ice, etc.
B. Inspect the safety climb device, if equipped, and steps, pegs, and rungs for damage.
C. Determine the possible exposure to RF radiation near or in front of any antennae.
D. Identify any other nearby hazards such as power lines, buildings, other towers, etc.
E. Each crew is to hold a pre-climb safety meeting daily. See attached Daily Meeting form
F. Any tower that is deemed unsafe to climb shall immediately be brought to the attention of the Project Engineer and/or the Safety Department.

VI. Climbing
A. Two Competent Tower Climbers are required on any project during any climbing activity.
B. Climbers are to maintain three points of contact when climbing or moving on the structure.
C. One-hundred percent attachment is required when climbing, moving, or working on any structure.
D. Anchorage points must be capable of supporting 5000 pounds or two times the anticipated impact load of a worker falling six feet.
   a. Anchoring to tower legs at joints and connections is the preferred anchorage point.
   b. Anchoring to lattice members with one bolted connection should be avoided. Lattice members with two or more bolted connections is preferred.
   c. Attachment to diagonal members should be avoided.
d. Padded lanyards or cables should be used when anchorage points have sharp edges.

E. A personal RF Monitor must be worn when climbing any structure with active transmitters.

VII. Crew Requirements

E. Only crews with the necessary skills and experience may erect, dismantle, or rig towers. Apprentices and other inexperienced personnel must work under the close supervision of an experienced crew member.

VIII. Planning

A. Contractors are responsible for the means, methods, techniques, and procedures for their work.

B. Obtain and review tower erection drawings, and any installation or erection manuals.

C. Verify that the foundation has been built to specifications and is capable of supporting construction loads.

D. Determine whether any of the erection can be done on the ground to minimize work at elevation.

E. Ensure that all tower components have been delivered in good condition.

F. Make sure any cranes used have a current annual inspection and a satisfactory daily inspection by a competent person.

G. Select the appropriate means of accessing the tower. Consider the use of manbaskets or aerial lifts for very high towers.

IX. Erecting Towers

A. Perform as much assembly on the ground as possible to minimize fall hazards.

B. Install climbing pegs and ladder sections while the pieces are on the ground.

C. Double check that all bolting has been installed and tightened to specifications. Use only structural bolts supplied with the tower. Contact the manufacturer immediately about any missing hardware or components.

D. Install temporary fall protection and descent lines on the tower sections on the ground where practical.

E. Install the permanent safety climb device, if equipped, as soon as possible.
F. Use tag lines when picking tower components.
G. Do not attach any components to the tower that interfere with the climbing ladder or step bolts.
H. Any welding, drilling, or cutting not specified on the drawings must be approved by the project engineer. Repair any damaged galvanized surfaces.

X. Drop Zone. The drop zone is a circle around the tower base with a radius of one half the working height on the tower (example, if climbers are working two hundred feet up on a tower, the drop zone is a one hundred foot radius circle around the base).
A. No unauthorized personnel are permitted within the drop zone.
B. Hard hats are mandatory in the drop zone.
C. Take cover near a tower leg or ice break when warned of falling objects (headache!)
# Daily Safety Meeting

## Job Information

<table>
<thead>
<tr>
<th>Date</th>
<th>Job name</th>
<th>Job #</th>
<th>Address</th>
<th>Longitude</th>
<th>Latitude</th>
<th>Supervisor</th>
</tr>
</thead>
</table>

## Personnel

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Certified Climber?</th>
<th>1st Aid/CPR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>□ yes</td>
<td>□ yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ yes</td>
<td>□ yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ yes</td>
<td>□ yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ yes</td>
<td>□ yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ yes</td>
<td>□ yes</td>
</tr>
</tbody>
</table>

Note – at least two certified climbers and two trained in 1st aid/CPR per project.

## Emergency Information

| Is cellular service available? | □ yes | □ no – What communication is available? |
| Is 911 service available?     | □ yes | □ no – Answer the three questions below. |
| Ambulance phone-              |       | Police phone- Fire Company phone-       |
| Is site accessible to EMS crews? | □ yes | □ no – What must done to improve access |
| Closest occupational health center? (call office for assistance) |       | |
| Are first aid supplies available? | □ yes | □ no – Replace before starting the project |
| Are fire extinguishers available | □ yes | □ no – Replace before starting the project |

## Daily Inspections

| Fall protection equipment | □ yes | □ n/a |
| Ropes                     | □ yes | □ n/a |
| Tower and site            | □ yes | □ n/a |
| Tower climbing system     | □ yes | □ n/a |
| Electric tools and cords  | □ yes | □ n/a |
| Hoists                    | □ yes | □ n/a |
| PPE                       | □ yes | □ n/a |
| RF monitors               | □ yes | □ n/a |
| RF suits                  | □ yes | □ n/a |

## Weather

<table>
<thead>
<tr>
<th>Temp.</th>
<th>Wind speed</th>
<th>Precipitation?</th>
<th>Snow/ice?</th>
<th>Lightning?</th>
</tr>
</thead>
</table>

No work is to be performed on towers or other elevated positions during severe weather

## Other Hazards

- Fall protection req. -warning lines, rails, covers
- Will confined spaces have to be entered
- Will excavations deeper than five ft. be entered
- Will crane baskets be used?
- RF radiation?
- Frequency?
- Field Strength/Power Density?
WORK ZONE SAFETY

I. Scope. This section applies to areas where roadwork is occurring and traffic is affected. Roadwork activity includes: bridge work, adding travel lanes to the roadway, repairing the roadway, repairing electric, gas, or water lines within the roadway.

II. Areas within a workzone. Work zones are divided into four areas:

A. Advance warning area – Section of the roadway alerting drivers to the work area.
   1. Signs used in this area may include Road Work Ahead, Flagger (Symbol), One Lane Road Ahead and Be Prepared to Stop (where appropriate).

B. Transition area – Section of the roadway where drivers are redirected to temporary lane with the use of channelizing devices.
   1. There must be a minimum of six channelizing devices in any taper.
   2. Channelizing devices must all be the same in a taper. (All cones or all vertical panels, etc.).
   3. Channelizing devices must be made of material that will not significantly damage vehicles if they are struck.

C. Activity area – Section of the roadway where work activity takes place.
   1. Channelizing devices are used to separate workers from traffic.
   2. Channelizing devices must be the same in a work area. (All cones or all vertical panels, etc.), but may be different than those in the taper.
   3. Channelizers should be spaced in feet two times the normal speed limit. (EX. Normal speed limit is 45 MPH, spacing is 90 ft. apart.)
D. Termination area – Section of the roadway used to return drivers to their normal lanes.
   1. Signs used here include End Road Work or End Active Work Zone.

III. Protective Measures: Protective measures are needed to protect the workers within the work zone and the public using the road.

A. Traffic Control Plan. The Temporary Traffic Control Plan (TTCP) describes the measures used to keep traffic moving safely and efficiently through the work zone. The measures selected depend on the residing authority, type of roadway, traffic conditions, length of the project, location restrictions and how close the workspace is to traffic. See appendix A at the end of this section for examples of common TTCP diagrams. Additional Traffic Control Plans can be found in the Manual on Uniform Traffic Control Devices, Part 6.

B. Signs.
   1. Signs must be visible at all times when work is being done and must be removed or covered when the hazards no longer exist.
   2. If signs become worn or damaged, they must be replaced.
   3. Generally, signs should be placed on the right-hand side of the roadway.

C. Signals. Signals warn of possible or existing hazards. They include:
   1. Sign paddles or flags held by flaggers.
   2. Portable changeable message boards.
   3. Flashing arrow displays.
   4. Channelizing Devices. Channelizing devices include, but are not limited to: cones, tubular markers, vertical panels, drums, barricades, temporary raised islands, and barriers. These devices protect workers in the work zone, warn and alert drivers to conditions
created by roadwork, and guide drivers. Make sure these devices are clean and visible.
   a) When using vertical slash panels the stripes should point to the road surface in the direction you want the vehicles to move toward.

IV. Flaggers. When signs, signals, and barricades do not provide enough protection for operations on highways or streets, then flaggers or other traffic controls must be provided. However, flagging is dangerous because it exposes the flagger to traffic. Flaggers should follow these rules:
   A. Stop/Slow paddles when hand signaling in daylight. These paddles are octagonal in shape and have a red STOP sign on one side and an orange SLOW sign on the other. They must be retro-reflective.
   B. Use red flags (at least 24 inches square) in emergency situations.
   C. Use red light wand when hand signaling at night.
   D. Follow the preferred flagging method using a paddle (see diagrams):
      1. To stop traffic – Face traffic and hold the STOP sign paddle toward traffic with your arm extended horizontally away from the body. Raise your free arm with your palm toward approaching traffic.
      2. To direct stopped traffic to proceed – Face traffic and hold the SLOW paddle toward traffic with your arm extended horizontally away from the body. Motion with your free hand for traffic to proceed.
      3. To alert or slow traffic – Face traffic holding the SLOW paddle toward traffic with your arm extended horizontally away from the body. You may motion up and down with your free hand, palm down, indicating that the vehicle needs to slow down.
4. Wear an approved traffic safety vest.
E. Coordinate with other flaggers and communicate by radio if you have no visual contact.
F. Know how to combat both heat and cold exposure, dress appropriately, and know where shelter is available.
G. Be alert to symptoms associated with carbon monoxide poisoning from vehicular traffic (nausea and headaches). If symptoms develop, get to fresh air.
H. Be aware of construction equipment around you; make sure equipment operators know where you are.

V. Safe Work Practices
A. When Working Near Traffic or Heavy Equipment:
   1. Wear highly visible clothing and a light colored hard hat. During the day, you must wear a vest colored orange, yellow, yellow-green, or a fluorescent version of these colors. At night, wear retro-reflectorized leg bands, a type 3 vest, and hard hat.
   2. Work where drivers can see you, but as far as possible from traffic. Be aware that drivers may not be able to see you when the sun is low in the sky or when it is rainy, foggy, or dark.
   3. Never get behind a backing vehicle.
   4. Stay alert, portable audio players, radios, cell phones and similar devices are prohibited. When you hear
backup alarms look to see where the vehicle is located and which direction it is backing.

VI. Night work
A. Retro-reflective PPE and equipment shall be used during night work.
   1. Type 3 vest is required.
   2. Leg bands are required.
   3. Channelizing devices shall be retro-reflective.
   4. Stop/Slow paddle for flaggers shall be retro-reflective.
   5. All signs shall be retro-reflective.
   6. Reflective tape applied to hard hats is recommended.
B. Work zone lighting.
   1. Adequate lighting shall be provided for workers in work zone.
   2. Flagger stations shall be illuminated at night.

VII. Other Work Zone Protective Measures. Other work zone safety precautions and protective measures:
A. Temporary barriers – These devices prevent vehicles from entering areas where hazards, workers, or pedestrians may be.
B. Lower speeds – If workers are especially vulnerable, work zone engineers should consider lowering the speed of traffic.
C. Shadow vehicle – If roadwork is mobile, like for pothole patching, a vehicle with proper lights, signs, or a rear impact attenuator (crash truck) should be used.
D. Vehicle arrest systems – This is fencing, cable, or energy absorbing anchors that prevent vehicles from entering activity areas while allowing the vehicle to safely slow down.
E. Rumble strips/SNAPS – These consist of textured road surfaces that alert drivers to changing conditions.
F. Road closure – If alternate routes can handle additional traffic the road may be closed temporarily to give you the greatest protection.
G. Law enforcement – For high risk work zones, police units may be placed to reduce traffic speeds.
H. Intrusion warning devices – These devices alert workers of vehicles that accidentally enter the work space.
VIII. Appendix A- Samples of common work zone applications.
Short-Term Stationary Operation
Two-Lane, Two Way Roadway-Flagging

32-8

ROAD WORK AHEAD
ONE LANE ROAD AHEAD
ROAD WORK AHEAD

1/2 D Max.

D Max.

100' Min

A

A

A

A

E

(Desirable)

200' Min.

50' Min-100' Max

Optional when a taper is used

100' Max

<table>
<thead>
<tr>
<th>MPH</th>
<th>A</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>250</td>
<td>50</td>
<td>155</td>
</tr>
<tr>
<td>30</td>
<td>300</td>
<td>60</td>
<td>200</td>
</tr>
<tr>
<td>35</td>
<td>350</td>
<td>70</td>
<td>250</td>
</tr>
<tr>
<td>40</td>
<td>400</td>
<td>80</td>
<td>305</td>
</tr>
<tr>
<td>45</td>
<td>450</td>
<td>90</td>
<td>360</td>
</tr>
<tr>
<td>50</td>
<td>500</td>
<td>100</td>
<td>425</td>
</tr>
<tr>
<td>55</td>
<td>550</td>
<td>110</td>
<td>495</td>
</tr>
</tbody>
</table>

Alternate Spacing for High Density Urban

25 100 50 155
30 100 60 200

All Highways
(except freeway and expressway)
ASBESTOS CONTAINING MATERIALS

I. General. This policy will provide guidance in the recognition and avoidance of materials that may contain asbestos and their hazards. Such materials may include: spray-on fireproofing, boiler and pipe insulation, duct insulation, acoustical plaster and tiles, brake shoes, transite, floor tiles, and many other materials.

A. Definitions.
   1. Asbestos. Asbestos is a naturally occurring mineral that is made of tiny, sharp fibers that are too small to see, feel or taste. Asbestos was used in many building materials and products. It is associated with many health hazards when it is breathed in.
   2. Asbestos Containing Material (ACM). Any material containing more than one percent asbestos.
   3. Class I asbestos work. Work involving the removal of thermal systems insulation or surfacing ACM. Examples include the removal of boiler insulation, pipe insulation or spray-on fireproofing.
   4. Class II asbestos work. Work involving the removal of any other type of ACM. Examples include transite sheeting and pipe, floor tiles and mastic, and roofing and siding shingles.
   5. Class III asbestos work. Repair and maintenance operations where any type of ACM is likely to be disturbed.
   6. Class IV asbestos work. Maintenance or custodial activities where ACM may be contacted but not disturbed. Includes clean up of Class I, Class II, or Class III work.
   7. Friable ACM. An asbestos containing material that can be crumbled under hand pressure. Spray-on fire proofing would be considered friable. Transite pipe would be considered non-friable.

II. Health Hazards. Asbestos is harmful when it becomes airborne. All of the diseases related to asbestos exposure have a latency period of ten to forty years. This means that you may not become sick until up to forty years after being exposed to asbestos. Exposure to airborne asbestos has been linked to the following diseases.
A. Asbestosis. “White Lung Disease”, a scarring of the lungs caused by chronic exposure to asbestos fibers.
B. Mesothelioma. A cancer of the lining of the lungs or stomach. Mesothelioma is not dose-related like the other associated diseases (dose-related means the more asbestos you are exposed to, the greater the likelihood of developing an asbestos related disease).
C. Lung cancer. Lung cancer is the most common disease related to asbestos exposure. Smokers exposed to asbestos are at a much greater risk of developing lung cancer.
D. Other cancers. Exposure to asbestos is also related to cancers of the stomach or gut.

III. Control Measures.
A. Abel employees are not permitted to perform any Class I removal or any Class II removal of ACM that may become friable. These types of work have very strict regulations by OSHA, EPA, DEP Bureau of Air Quality, and the Department of Labor and Industry.
B. Employees removing or disturbing any kind of ACM must be properly trained. Class II work, Class III work and Class IV work all have specific training requirements for employees.
C. Cleanup of ACM should be done with a High Efficiency Particulate Air (HEPA) filtered vacuum cleaner so fibers are not released into the air.
D. Wet methods should be used to minimize airborne fibers.
E. Prompt cleanup and disposal of materials in leak tight containers is required.
F. If a lot of dust is to be created from sanding, sawing, drilling, etc., an enclosure such as a glove bag will have to be used.
G. Respirators with P-100 filters and disposable coveralls must be worn if friable asbestos is removed or disturbed.
H. Work must be done in a regulated area to keep unauthorized employees away.

IV. Regulations. Asbestos is one of the most heavily regulated hazardous materials. Contact the Safety Department with any questions regarding the regulations on asbestos.
A. OSHA. OSHA’s standard on asbestos covers exposure monitoring (air sampling), respiratory protection and protective clothing, mandatory work practices, and training.

B. EPA. The EPA requires notification before friable materials are removed from a building (NESHAP permit). The EPA also developed the Model Accreditation Plan for training asbestos abatement workers.

C. Dept. of Labor and Industry. The PA DOLI requires that any employee in Pennsylvania performing Class I and some Class II asbestos abatement be trained and licensed. The training consists of forty hours of instruction based on the EPA Model Accreditation Plan.
I. General. Back injuries account for a large percentage of work related accidents. Four out of five adults will suffer from back pain at some point in their lives. This section discusses the anatomy of the back, risk factors for back injury, how to prevent back injuries, and tips for treating sore backs.

II. Anatomy of Your Back. The term back injury may refer to an injury to any one of the following structures in your back.

A. Vertebrae. Your spine consists of a stack of 33 bones called vertebrae. The vertebrae form an S-shaped column that houses the spinal cord, the message center from your brain to your body.

B. Discs. The discs are the cushions between the vertebrae. Discs are like a jelly doughnut with a soft inner core and a tough outer coating. Herniated, slipped, bulging or ruptured disc are all terms meaning the inside of the disc is squeezing out of the tough outer coating.

C. Ligaments and Muscles. Most back injuries are strains to the muscles or ligaments in the back. These injuries typically heal completely but can recur if prevention techniques are not followed.

III. Risk Factors for Back Injuries. The following factors place workers at an increased risk of back injury.

A. Lifting heavy objects, especially from low, high or awkward positions. Objects lifted from below knee height or above shoulder height place additional strain on the back.

B. Performing jobs that require frequent bending.

C. Weak and fatigued muscles cannot support the back as well and are more likely to result in back injury.

D. Poor posture while standing or sitting can lead to back injury.

E. Being overweight. People more than 20% overweight are at increased risk of back injury.
IV. Safe Lifting Practices. Most work related back injuries occur over a period of time as a result of workers using poor lifting techniques or improper body mechanics. In addition to reducing or eliminating the other risk factors listed above, following these safe lifting practices will minimize back injury and low back pain.

A. Do not move large or heavy objects manually if it can be done with a piece of equipment. Use a forklift, hoist or other piece of equipment to do the job if one is available.

B. Teamwork! Get help to lift heavy objects if mechanical equipment is not available.

C. Break down the load into two smaller loads if possible. Make two small lifts rather than one heavy lift.

D. Pre-plan your route before you lift heavy or large objects. Make sure there are no tripping hazards, slippery surfaces or obstacles in your way. Have someone open doors, gates, etc. for you.

E. Get as close to the load as possible. Squat down with one foot slightly forward for balance. Position the load between your legs if possible. Keep your back straight and lift with your legs. Keeping the load as close to your center of gravity as possible reduces strain on your back.

F. Try to store heavy objects, such as Simon forms, between knee and shoulder height to avoid awkward lifts.

G. Glue your hand to your thigh when lifting heavy objects with one hand, such as a heavy toolbox. Place your free hand on the outside of your thigh and mentally “glue” it there. This will help keep your back aligned. Bending or tilting to the side can be just as bad for your back as bending forward.

H. Do not twist your body while lifting a heavy load. Move your feet and turn your whole body. When using a shovel step into the direction you are throwing the material, do not simply twist at your waist to toss the shovel full.

I. Avoid fast jerking motions when lifting a heavy load.
J. Push heavy carts rather than pulling on them. This is less stressful on the back.

V. Caring for a Sore Back. Always report all back injuries to your supervisor and follow all physician’s recommendations.
   A. Aspirin will help reduce inflammation and relive pain.
   B. Ice packs will further reduce swelling and slow the nerve impulses causing pain. Use ice packs to massage the area for a few minutes. Do not leave ice on exposed skin for too long, frostbite can occur. Ice packs can also be wrapped in a towel.
   C. Stretch your back by lying on your back and bringing your knees up to your chest and hugging them there. Hold that position for several minutes. Do one knee at a time if both knees at once is uncomfortable.
   D. Rest by laying on your back with your calves and feet elevated on a couch, pillow or a small stool. This is the position that puts the least amount of pressure on your back.
   E. When sitting or driving keep your knees higher than your hips. Move the car seat closer to the steering wheel. Roll up a small towel to support your lower back while sitting. Do not sit for too long, get up and move around as much as possible.
   F. Keep active (within your prescribed limitations!) to prevent your back from stiffening up. Walking is a good exercise for low back pain.
   G. If back problems continue, or they are extremely painful, see a physician at once.
I. Scope and application. This policy applies to all employees who may be reasonably anticipated to have an occupational exposure to blood or other potentially infectious material.

II. Definitions. The following terms are used throughout this policy:

A. Bloodborne Pathogen means pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV), and human immunodeficiency virus (HIV).

B. Contaminated means the presence or reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

C. Decontamination means the use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use or disposal.

D. Exposure Incident means a specific eye, mouth or other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee’s duties.

E. Occupational Exposure means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of employee’s duties.

F. Other Potentially Infectious Materials means:

1. The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids where it is impossible to differentiate between body fluids.

2. Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and

G. Universal Precautions is an approach to infection control. According to the concept of Universal Precautions, all human
blood and certain human body fluids are treated as if known to be infectious for HIV, HBV or other bloodborne pathogens.

III. Exposure Control.
A. Exposure Determination.
   1. Affected employees. Supervisory personnel trained in First Aid and CPR may have an occupational exposure to bloodborne pathogens.
   2. Tasks or procedures at risk. Supervisory personnel may be occupationally exposed to bloodborne pathogens while administering care to injured or ill employees.
B. Control Methods.
   1. Universal Precautions will be observed at all times to prevent contact with blood or other potentially infectious materials.
   2. Engineering Controls.
      a) Employees shall wash their hands and any other skin with soap and water, or flush mucous membranes with water immediately after contact of such body areas with blood or potentially infectious materials.
   3. Personal Protective Equipment. The following personal protective equipment shall be available for use when the possibility of contact with blood or other potentially infectious materials exists:
      a) Employees will wear appropriate eye and face protection as conditions warrant.
      b) Latex gloves will be provided in all first aid kits and used for all care administered.
      c) CPR shields equipped with a one way valve will be supplied to any individual required to perform CPR.

A. Hepatitis B Vaccination. I. B. Abel shall make available the Hepatitis B vaccination to all employees who have an occupational exposure and post exposure evaluation and follow-up to all employees who have an exposure incident.
   1. Employees have the right to refuse the hepatitis B vaccination series and may change their minds at any time in the future and initiate the vaccination series.
B. Post Exposure Evaluation and Follow-Up. Following a report of an exposure incident, a confidential medical evaluation and follow-up will be provided. They shall consist of the following:
   1. Documentation of the route of exposure and the circumstances leading to the exposure incident.
   2. Identification and evaluation of the source individual if possible.
   3. If consent is received, the source individual shall receive screening for HIV and HBV infectivity.
   4. Screening of the affected employee’s blood for HIV and HBV infectivity.
   5. Post exposure treatment if necessary.
   6. Counseling if necessary.
   7. Evaluation of reported illnesses.

V. Training. First aid, CPR and bloodborne pathogens training is conducted on an annual basis. Only employees who participate in this training are permitted to render first aid or CPR. The bloodborne pathogens training shall consist of the following:
   A. An explanation of the Bloodborne Pathogens Standard.
   B. A general explanation of the epidemiology and symptoms of bloodborne diseases.
   C. An explanation of the modes of transmission of bloodborne diseases.
   D. An explanation of the Exposure Control Plan.
   E. An explanation of the controls to be used to limit exposures to bloodborne diseases.
   F. Information on the PPE to be used to control exposures.
   G. Information on the hepatitis B vaccine, including its effectiveness, safety, method of administration, the benefits of being vaccinated, and that the vaccine is free of charge.
   H. Information on the procedure to follow in the event of an exposure incident.
   I. Information on post-exposure evaluations and follow-up treatment.
CARBON MONOXIDE

I. This policy will provide guidance in preventing adverse health effects associated with working around Carbon Monoxide.

A. Carbon Monoxide (CO)

1. CO is an odorless, colorless gas that interferes with the delivery of oxygen in the blood to the rest of the body.
2. Under high pressure it is a liquid.
3. OSHA’s Permissible Exposure Limit (PEL): 50 ppm Based on 8 hour Time Weighted Average (TWA)
4. OSHA’s Immediately Dangerous Life or Health Limit (IDLH): 1200 ppm based on 8 hour Time Weighted Average (TWA). Gas monitors are available from the Safety Department.

B. Sources of CO

1. CO is produced as a result of incomplete burning of carbon-containing fuels including gasoline, coal, wood, charcoal, natural gas, and fuel oil.
2. It can be emitted by combustion sources such as unvented kerosene and gas space heaters, furnaces, wood stoves, gas stoves, fire places, water heaters, automobile exhaust, gas powered tools, and tobacco smoke.

C. Health Effects of Carbon Monoxide

1. CO is an asphyxiant to humans.
2. CO interferes with the distribution of oxygen in the blood to the rest of the body.
3. Inhalation of CO causes tissue hypoxia by preventing the blood from carrying sufficient amounts of oxygen to the brain.
4. Depending on the amount inhaled, this gas can impede coordination, worsen cardiovascular conditions, and produce fatigue, headache, weakness, confusion, disorientation, nausea, and dizziness.
5. Very high levels can cause death.

D. Construction Site CO Exposure
1. Make sure all vehicles, welders, gas powered tools are not operated in enclosed areas.

E. CO Poisoning
1. Get individual to fresh air immediately.
2. Turn off CO producing vehicles, equipment or tools immediately.
3. Let the Emergency Medical Technician (EMT) know if CO poisoning is suspected.

F. Safeguards for Reducing Exposure to CO
1. Beware of health effects and hazards associated with CO.
2. Air Monitoring prior to allowing work to take place in areas where suspected high levels of CO may exist.
3. Engineering Controls such as proper ventilation.
4. Knowing work operations where exposure exists.
5. Wearing appropriate respiratory protection. Only supplied air respirators protect against CO.
HAZARD COMMUNICATION

I. Scope. The purpose of this program is to ensure that information on the hazards of the chemicals used by employees is transmitted by means of container labeling, material safety data sheets, and employee training. This program applies only to those chemicals known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

II. Labels and other forms of warning.
   A. Each container of hazardous chemicals shall be labeled, tagged or marked with the following information:
      1. Identity of the hazardous chemicals contained therein; and,
      2. Appropriate hazard warnings, or alternatively, words, pictures, symbols, or combinations thereof, which provide at least general information regarding the hazards of the chemicals. The preferred hazard warning label will be the NFPA 704 Labeling System (see attached)
   B. Labels are not required for portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the use of the person who performed the transfer.

III. Material Safety Data Sheets
   A. The jobsite supervisors are required to keep an up-to-date index of all new hazardous material that is being used or stored onsite. This index should be kept in a location that is easily accessible if an MSDS is requested by an employee, subcontractor, or local or federal agency.
   B. Each supervisor shall have or obtain a jobsite poster to keep with the index or post in the job or tool trailer.
   C. All employees have 24-hour access to the new service for related inquires or incidents.
      1. How to use the service:
         a) Call 800-451-8346
b) Give them your Company Name and Callers Name

c) Identify if this is an:
   (1) Emergency: Immediate – 15 minute turn around on requests
   (2) Urgent: Immediate – 30 minute turn around on requests
   (3) Standard: Immediate – 8 hours turn around on requests

d) Provide them with the needed Product Identification Information

e) Tell them where you would like it sent or faxed to
   (if you need you may always have it sent to the Safety Department, address and fax number below, and we will get it to you, but make sure to have them note your name or the job name so we know who or where to get it to)

IV. Employee information and training
   A. Employees shall be provided with effective information and training on hazardous chemicals in their workplace whenever a new physical or health hazard the employees have not been trained about is introduced into their work area.

      1. Employees shall be informed of the following information:

         b. Any operations in the work area where hazardous chemicals are present
         c. The location and availability of the written Hazard Communication program, including the lists of hazardous chemicals and MSDSs

      2. Employee training on specific chemicals or building materials shall include at least:

         a. Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring, odor, visual appearance of a release).
b. The physical and health hazards of the chemicals in the work area.
c. The measures employees can take to protect themselves from these hazards, including specific procedures such as work practices, emergency procedures, and PPE
d. The details of the IB Abel, Inc. Hazard Communication Program including an explanation of the labeling system (NFPA 704), Material Safety Data Sheets and how employees can use the appropriate hazard information.

Section 1.01 NFPA 704 diagram

The blue diamond, appearing on the left side of the label, conveys Health Hazard information. A number from 0 to 4 appears in the blue diamond indicating the degree of the hazard. The higher the number the higher the hazard, as follows:
0- No hazard
1- Can cause irritation if not treated
2- Can cause injury. Requires prompt treatment
3- Can cause serious injury despite medical treatment
4- Can cause death or major injury despite medical treatment
The red diamond, appearing at the top of the label, conveys **Flammability Hazard** information. Again, the numbers 0 to 4 are used to rate the flammability hazard as follows:

0- No hazard  
1- Ignites after considerable heating  
2- Ignites if moderately heated  
3- Can be ignited at all normal temperatures  
4- Very flammable gases or very volatile flammable liquids

The yellow diamond, appearing on the right side of the label, conveys **Reactivity Hazard** information. The numbers 0 to 4 are used to rank reactivity hazards as follows:

0- Normally stable. Not reactive with water  
1- Normally stable. Unstable at high temperature and pressure. Reacts with water  
2- Normally unstable but will not detonate  
3- Can detonate or explode but requires strong initiating force or heating under confinement.  
4- Readily detonates or explodes

The white diamond, appearing at the bottom on the label, conveys **Special Hazard** information. This information is conveyed by the use of symbols, which represent the special hazard. Special hazards such as: acids, alkaline, corrosive, oxidizers, radioactive, and toxic.
HEARING LOSS PREVENTION

I. This policy will provide guidance in preventing adverse health effects associated with working around Occupational Noise.
   A. Occupational Noise Exposure
      1. Exposure to high levels of noise causes hearing loss.
      2. OSHA requires hearing protection to be worn when noise reaches 85 decibels for an exposure time of eight hours.
      3. Wearing company provided hearing protection reduces the risk of hearing loss.
   B. Sources of Construction Site Noise
      1. Heavy Equipment
      2. Welders and generators
      3. Trucks
      4. Power tools
   
      Note – Any time you have to shout to be heard, you are being over exposed to noise.

   C. Health Effects of Noise
      1. The extent of the damage depends primarily on the intensity of the noise and the duration of the exposure.
      2. Temporary Hearing Loss results from short-term exposure to noise, with normal hearing returning after period of rest.
      3. Permanent Hearing Loss results from long-term exposure to noise over a period of time, and gradually causes permanent damage.
   D. Safeguards for Reducing Exposure to Noise
      1. Work site controls (positioning loud equipment away from workers)
      2. Engineering Controls (mufflers, sound walls, enclosures)
      3. PPE (ear muffs, ear plugs)
E. Ear Plug Instructions (see diagram)
1. ROLL the plug with clean hands into smallest diameter cylinder possible without wrinkles.
2. INSERT the tapered end quickly into ear canal. This may be easier by reaching over your head with your free hand and gently pulling up and back on your ear.
3. HOLD the plug in place until it is fully expanded.
4. RELEASE. The plug should stay fully inserted in your ear canal.
LEAD

I. General. This program applies to all projects where employees may be exposed to lead. Examples of such projects include demolition or salvage of structures where lead or materials containing lead (such as lead based paint) are present; removal or encapsulation of materials containing lead or installation of materials containing lead. Keeping lead dust out of the air and practicing good hygiene are the keys to reducing lead exposure.

II. Health hazards. Lead can enter the body through inhalation when it is airborne or through ingestion. Exposure to lead effects the following systems:
   A. Nervous system. Mood and personality changes and retarded mental development at high doses.
   B. Renal (blood making) system. Leads to chronic fatigue, anemia.
   C. Gastrointestinal tract leading to colics and cramping (may be flu-like symptoms).
   D. Reproductive systems in men and women (including increased risk of miscarriage)
   E. Kidney damage.

III. Control Measures.
   A. Employees exposed to airborne lead will be provided appropriate respiratory protection in accordance with the Respiratory Protective Equipment section.
   B. If large amounts of lead containing dust are created, protective clothing will be provided to prevent contamination of workers clothing and the spread of lead contamination.
   C. Employees exposed to lead containing materials shall not eat, drink, smoke or apply cosmetics in the work area.
   D. Work areas will be kept as clean as possible to reduce the spread of lead contamination.
E. Washing facilities will be provided to employees exposed to lead dust to wash before leaving regulated areas and taking breaks.

F. Employees who may be exposed to high levels of lead will be enrolled in a medical surveillance program to monitor blood lead levels and other indicators of lead exposure. Employees over-exposed to lead will be transferred to another project.

IV. Regulations
   A. OSHA. OSHA regulates worker’s occupational exposure to lead. The standard includes requirements for exposure monitoring, respiratory protection and biological monitoring of employees. OSHA also sets a permissible exposure limit for airborne lead.
   B. EPA. The Environmental Protection Agency regulates many aspects of lead. Removal of lead based paints in child occupied facilities is treated much like their requirements for asbestos abatement.
RESPIRATORY PROTECTIVE EQUIPMENT PROGRAM

I. Scope
A. I. B. Abel has established a respiratory protective equipment program to protect employees from occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays or vapors. The primary objective will always be to prevent atmospheric contamination by accepted engineering control measures such as enclosure or confinement of the operation, general or local ventilation, and substitution of less toxic materials.
B. When engineering controls are not feasible, respirators shall be provided to protect employees.

II. Selection
A. Selection of respiratory protection will be controlled through the Safety Department.
B. Only NIOSH-certified respirators shall be used. Respirators shall be used in compliance with the conditions of its certification.

III. Medical Evaluation.
A. All employees required to use respirators shall receive a medical evaluation to determine their ability to do so safely.
B. Medical evaluations shall be provided by Workfirst Occupational Healthcare.
C. Evaluations shall be conducted in accordance with OSHA’s Respiratory Protection standard.

IV. Fit Testing
A. Before employees are permitted to use a respirator with a negative or positive pressure tight-fitting facepiece, they must be fit tested with the same make, model, style and size of respirator that will be used.
B. Employees shall be fit tested prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, or at least annually thereafter.

C. Additional fit testing may be required whenever the employee reports, or the supervisor or Safety Director makes visual observation of, changes in the employee’s physical condition that could affect the respirator’s fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

D. The test shall be administered using an OSHA-accepted fit test protocol.

V. Use of Respirators

A. Respirators with tight fitting face pieces shall not be worn by employees with:
   1. Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function: or
   2. Any condition that interferes with the face to facepiece seal or valve function

B. Safety Glasses, corrective lenses or other personal protective equipment shall be worn in such a manner that does not interfere with the seal of the facepiece to the face of the user.

C. Each time a respirator is put on, employees shall perform a seal check in accordance with manufacturers recommendations

D. Employees shall leave the respirator area:
   1. To wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use; or
   2. If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece.
VI. Maintenance and Care of Respirators

A. Employees shall ensure that all respirators are stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the facepiece and exhalation valve.

B. All respirators are to be inspected as follows:
   1. All respirators used in routine situations shall be inspected before each use and during cleaning.
   2. Any respirator maintained for use in emergency situation shall be inspected at least monthly and in accordance with the manufacturer recommendations, and shall be checked for proper function before and after each use.

C. Respirator inspection shall include the following:
   1. A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, headstraps, valves, connecting tube, and cartridges, canisters or filters; and
   2. A check of elastomeric parts for pliability and signs of deterioration.

D. Respirators that fail an inspection or are found to be defective shall be removed from service, discarded, repaired or adjusted in accordance with manufacturers recommendations
   1. Repairs or adjustments shall only be made by persons appropriately trained and shall use only the respirator manufacturer’s NIOSH approved parts designed for the respirator.
   2. Repairs to respirators used for emergency situations shall only be repaired by the manufacturer or a technician trained by the manufacturer.
VII. Training. I. B. Abel shall provide training to all employees required to wear respirators. Training shall occur prior to any employee being assigned to a job requiring the use of respiratory protection.

A RESPIRATOR MUST FIT WELL TO PROTECT WELL

ALWAYS CHECK THE FACE SEAL
It is important to do a user seal check every time you put on a respirator.

**Negative Seal Check**
- Cover the filters so that air cannot be drawn through them.
- Collapse the mask against your face by inhaling gently. Hold your breath for ten seconds.
- If air leaks in and the mask reinflates, adjust the straps and try again.
- If air does not leak in and the mask stays collapsed against your face, it has passed the negative face seal check.

**Positive Seal Check**
- Cover the exhalation valve with the palm of your hand.
- Inflate the mask slightly by exhaling gently. Wait a few seconds.
- If air leaks out and the mask deflates, check the valves, adjust the straps and try again.
- If the face seal holds the air and the mask stays inflated, it has passed the positive face seal check.
I. This policy will provide guidance in preventing adverse health effects associated with working around Crystalline Silica.

A. Crystalline Silica (quartz)
   1. Crystalline Silica is a natural material found in the earth’s crust, it is a basic component of sand and granite.
   2. Crystalline silica is found in many building products including concrete and masonry products.
   3. Crystalline silica is linked to diseases of the lungs when it is in the air and workers breathe it in.

B. Silicosis
   1. Silicosis is a disease of the lungs due to breathing of dust containing crystalline silica particles. This dust can cause fibrosis or scar tissue formations in the lungs that reduce the lung’s ability to expand and contract effecting extraction of oxygen from the air. There is no cure for this disease, thus, prevention is the only answer.

C. Symptoms of Silicosis
   1. There are several stages of silicosis and early stages may go completely unnoticed. Continued exposure may result in the exposed individual noticing shortness of breath upon exercising, possible fever and occasionally bluish skin at the ear lobes or lips.
   Silicosis makes an individual susceptible to infectious disease of the lungs like tuberculosis. Progression of the disease leads to fatigue, extreme shortness of breath, loss of appetite, pain in the chest, and respiratory failure, which all may lead eventually to death. Acute silicosis may develop after short periods of exposure. Chronic silicosis usually occurs after 10 or more years of exposure to lower levels of quartz. Smoking can add to the damage caused by crystalline silica exposure.

D. Construction Site Crystalline Silica Exposure
1. Concrete mixing, concrete drilling, concrete/brick cutting or sawing and jack hammering.
2. Sand blasting to remove paints and rusts from various surfaces.
3. Work in foundries.

E. Safeguards for Reducing Exposure to Crystalline Silica
   1. Beware of health effects and hazards associated with crystalline silica.
   2. Wearing approved respirators for protection against crystalline silica-containing dust.
   3. Engineering Controls such as spraying water and proper ventilation.
   4. Knowing work operations where exposure exists.
   5. Wash hands and face before eating, drinking, or smoking outside areas where there is dust containing crystalline silica.
   6. Air Monitoring
   7. If you have any questions please refer them to the Safety Department.
SMOKING

I. This policy will provide guidance in preventing adverse health effects associated with Smoking.
   A. Smoking
      1. Cigarette smoking is the leading preventable cause of death in the United States; it is responsible for one in every five American deaths. Smoking claims the lives of an estimated 1,100 people per day—over 400,000 smokers die from smoking-related diseases and 3,000 nonsmokers die from lung cancer each year.
   B. Health Effects of Smoking
      1. Results in premature death and causes significant disease and disability.
      2. Coronary heart disease and stroke.
      4. Can cause Chronic Bronchitis and Emphysema.
   C. Examples of hazardous materials that when combined with smoking present a serious health risk:
   D. Pennsylvania (PA) Smoking Guidelines
      1. Pennsylvania currently has no current occupational smoking regulation. Follow signs designating smoking areas.
   E. Maryland (MD) Smoking Guidelines
      1. Smoking is not permitted in the following areas: Enclosed Workplace, Indoor Work Area, Employee Lounge, Restrooms, Conference/Meeting Room, Office Trailer, Classroom, Cafeteria owned and operated by employer, Hallway, Restaurant, Hotel/Motel Room, and a vehicle when an employee uses it in the course of employment and it is occupied by more than one employee.
2. Post at each entrance to a place of employment having an enclosed workplace a sign stating that smoking is not permitted.

3. An employer may permit smoking in a designated smoking area if it meets the requirements of regulation.
TEMPERATURE EXTREMES

I. This policy will provide guidance in preventing adverse health effects associated with Hot / Cold Temperature Extremes.

A. Heat Stress
   1. Heat is a serious hazard in construction. Your body builds up heat when you work and sweats to get rid of extra heat. But sometimes your body may not cool off fast enough.
   2. Heat Stress depends on many things: Your physical condition, weather, how much clothing you have on, how fast you must move, how much weight you must lift, if there is a breeze and if you are working directly in the sun.

B. Effects of Heat Stress
   1. Dehydration – when your body loses water, you can’t cool off fast enough feeling thirsty and weak.
   2. Cramps – Drinking plenty of water will reduce the risk of cramping.
   3. Heat Exhaustion – You feel tired, nauseous, headachy, and giddy (dizzy and silly). Skin will feel damp to the touch and look muddy/flushed and there is a possibility of fainting.
   4. Heat Stroke – Skin will feel hot to touch, dry and body temperature will be very high. Confusion, convulsions, unconsciousness and death may result from heat stroke.

C. Safeguards for Reducing Exposure to Hot Temperature Extremes
   1. Drink a lot of cool water all day – before you get thirsty. (Every 15 minutes drink 5-7 ounces of water)
   2. Keep taking rest brakes. Rest in cool shaded areas.
   3. Wear light-colored clothing made of cotton.
   4. Do the heaviest work during coolest time of the day.

D. Cold Stress
1. A cold environment forces the body to work harder to maintain its temperature.
2. Four factors that contribute to cold stress are Cold Temperatures, High or Cold Winds, Dampness and Cold Water.
3. Cold air, water, and snow all draw heat from the body.

E. Health Effects of Cold Stress
1. When in a cold environment, most of your body’s energy is used to keep your internal temperature warm. Over time, your body will begin to shift blood flow from you extremities (hands, feet, arms and legs) and outer skin to the core (chest and abdomen). This allows exposed skin and the extremities to cool rapidly and increase the risk of the following:

2. Frostbite
3. Hypothermia
4. Trench Foot

F. Safeguards for Reducing Exposure to Cold Temperature Extremes
1. Dress appropriately for weather conditions. Dress in three different layers (outer, middle and inner). Cotton and wool are preferred materials.
2. Wearing a hat. Up to 40% of body heat can be lost if head is left exposed. Hardhat liners are available from the warehouse.
ACKNOWLEDGMENT OF RECEIPT

I have been issued the I. B. Abel, Inc. Safety Handbook. I have read and understand all of the policies and procedures contained in it. I understand that working safely is a condition of my employment at Abel.

__________________________________________
Employee Signature

__________________________________________
Print Name

__________________________________________
Date Signed and Received