CONTRACTOR SAFETY GUIDE

Agreement form, Guide and Appendices

Environmental Health and Safety

http://www.ncsu.edu/ehs/
919-515-7915
NORTH CAROLINA STATE UNIVERSITY
CONTRACTOR SAFETY AGREEMENT FORM

This agreement must be reviewed and signed by all contractors/subcontractors prior to working at NC State University (NCSU).

Contractor Company Name __________________________________________ Assigned Work Location(s) ______________________________

Please initial each item.

_____ 1. I have reviewed the Contractor’s Safety Reference Document and am aware of the safety requirements of NCSU.

_____ 2. Emergency and evacuation procedures shall be explained to the contractor by the Facilities Project Manager or designee prior to beginning work (see 6.11, 6.12).

_____ 3. All contractor personnel must wear appropriate work apparel including personal protective equipment, as required (see 6.31).

_____ 4. Hazardous chemicals are present at NCSU in certain buildings and operations. Contractor personnel must familiarize themselves with campus safety procedures and emergency evacuation plans for the area(s) they are working in.

_____ 5. No hazardous or flammable chemicals may be brought on to NCSU property without written approval from the EHS office. Material Safety Data Sheets are required, for any chemicals that are permitted on campus.

_____ 6. No disturbance of suspect asbestos and lead materials is allowed. Prior to any work activity the presence or absence of these materials must be verified (see 6.02 and 6.25).

_____ 7. Contractor is expected to maintain all required OSHA related training for their employees and verify training for their sub-contractors.

_____ 8. Contractor shall ensure that only qualified electricians are permitted to work on electrical systems and equipment. Adherence to all applicable OSHA and NFPA standards including LOTO is required (see 6.08, 6.09, 6.27).

_____ 9. The contractor is responsible for maintaining good housekeeping and means of egress for building occupants and their workers in and around their work area (see 6.21).

_____ 10. The contractor will not discharge any chemicals, paints, oils, etc. substance to any drain without approval from NCSU Facilities Project Manager or the EHS Office. Costs associated with cleanup of any discharge will be the responsibility of the contractor.

_____ 11. Any contractor personal or property accidents or cases of job related injuries/illnesses must be immediately reported to NCSU Facilities Project Manager.

_____ 12. Contractors/subcontractors shall know the location of the nearest fire extinguisher; pull station alarm and first aid equipment. In the event of a fire/emergency notify the nearest NCSU employee and the Facilities Project Manager.

_____ 13. Contractor safety meetings must be held as needed to communicate job-site safety information for all contractors regularly working on NCSU property for extended periods of time.

_____ 14. Any work occurring at a height of 6 feet above a lower level must utilize appropriate fall protection (see 6.18) Guardrails shall be utilized as required (see 6.03).

_____ 15. Any crane, derrick or hoist brought onto NCSU property must have an annual inspection performed by a certified testing agency and operated only by a certified operator (see 6.07).

_____ 16. A Hot Work Permit must be completed and signed by the NCSU EHS Fire Marshal before any torch-cutting, welding or other similar heat-generating work begins indoors or outdoors (see 4.05).

_____ 17. Depending on the nature of the contractor’s activities, the following permits must be issued prior to beginning work: Confine Space Entry Permit, Roof-Top/Ceiling Permit and Excavation/Trenching (see 6.05, 6.34, 6.14).

All contractors are required to sign, in agreement that they have received a copy of the Contractor Safety Agreement Form and have read and fully understand its contents. This form must be returned to the EHS office and kept on file by the Facilities Project Manager.

The undersigned contractor represents and warrants that they shall comply with all applicable Federal, State and Local laws, regulations and rules while engaged to perform services for NCSU. Any contractors/subcontractors who violate these rules may be precluded from conducting work for NCSU. The contractor is also responsible for ensuring that all employees and subcontractors comply with these rules.

Contractor/Subcontractor/Laborer

Print Name ___________________________ Signature ___________________________ Date ___________________________

Assigned Facilities Project Manager

Print Name ___________________________ Signature ___________________________ Date ___________________________

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Foreword

**Safety** is a primary goal of all involved in construction at North Carolina State University (NC State). The University, the project Designer and Contractor each desire a project that is safe for the people who will construct, visit or use the facility before and after construction. While the project is under construction the Contractor has the primary and ultimate responsibility for safety. Neither this guidebook nor any other communications from representatives of the University or Designer reduces the Contractor’s responsibility to create and maintain a safe project.

“Article 11. Protection of Work, Property and the Public” of the General Conditions of the construction contract requires compliance with two documents. The first is the Associated General Contractors (AGC) *Accident Prevention Manual in Construction*. The second is the Occupational Safety and Health Standards (OSHA) for the Construction Industry (Title 29, Code of Federal Regulations, Part 1926) with revisions as adopted by General Statutes of North Carolina 95-126 through 155. These sources have been used extensively in the preparation of this Guidebook.

This Guidebook is intended to be a convenient source of information for the Contractor. However, the Guidebook is intended to be used in concert with, not in place of, the above mentioned references. As with other contract issues, the Contractor should notify the NC State PM or Designer if conflicts are found within these documents. Until a clarification is provided the Contractor should assume that the most stringent regulations applies, as long as compliance does violate the requirements of other documents. In case of irreconcilable conflict, OSHA 1926 will apply since noncompliance would be illegal.

The NC State Project Manager (NC State PM) or the Designer may raise questions concerning safety. The contractor shall promptly answer all questions. Both the NC State PM and the Designer have authority to stop work until the Contractor corrects the unsafe condition, ceases the unsafe activity or otherwise resolves the issue. Delays caused to address reasonable safety concerns shall not be compensable. In the case of a difference of opinion between parties OSHA or other appropriate authorities may be called in to resolve the dispute.

The Contractor shall be responsible to ensure that all employees and all subcontractors’ employees are familiar with these standards and regulations. Contractor and subcontractor employees must adhere to these requirements at all times while on the NC State Campus and while performing contracted work. Violations of any safety guidelines may result in removal of the contractor from the NC State Campus and contract **termination**. The General Contractor is responsible for all sub-contractors’ compliance with all safety standards.
1.0 Purpose

The purpose of this document is to facilitate enforcement of various “Safety” aspects as applicable to construction and repair work performed at NC State. Work includes large construction projects, informal contracts, purchase orders, or work by NC State staff.

2.0 Scope

This document contains general discussion to highlight the more frequent safety issues normally found at construction sites at NC State.

3.0 Select Definitions

- Confined Space – A space that is large enough and so configured that an employee can bodily enter and perform assigned work, and has limited or restricted means for entry or exit and are not designed for continuous employee occupancy. For example, tanks, vessels, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.
- Contractor – The management and workers providing services, including all subcontractor personnel. The contractor is fully responsible for his subcontractors' compliance.
- Contractor Safety Plan - The Contractor must develop and implement a comprehensive safety plan for his or her employees, which cover all aspects of onsite construction operations and activities associated with the contract. This plan must comply with all applicable health and safety regulations and any project-specific requirements.
- NC State PM – Owner's construction project manager.
- Safety Representative – An employee that represents all employees in discussions with the employer on health, safety or welfare; investigates hazards and dangerous occurrences; investigates complaints; carries out inspections of the workplace and inspects relevant documents; and attends safety committees.
- Work Zone – the outer boundary of the area or space in which a contractor conducts work or operates equipment or vehicles.
- Minimum approach distance – the boundary of the space containing any facility and which the contractor or other worker is to remain beyond and away from such facility.

4.0 Requirements

4.01 Responsibilities

- Contractors are required by Federal and State of North Carolina regulations to meet a wide range of requirements for worker and public safety. NC State contracts included “General Provisions” and “Additional General Provisions” that apply.
- Contractors are required to meet OSHA requirements. OSHA inspectors frequently visit the NC State campus unannounced. They have the authority to issue warnings, citations, and fines, and can order the NC State PM to “STOP WORK”. The NC State PM will have the authority to enforce all safety requirements as documented within this set of Guidelines and all safety provisions of the contract under which the contractor is operating on NC State properties and facilities. The NC State PM must be notified prior to:
  - Performing blasting operations or use of powder-actuated tools
  - Starting operations that will produce excessive odor, dust, noise affecting occupied building or work near air intakes
  - Using a combustion engine indoors
  - Air lifts with cranes, derricks, or hoists
  - Breaking ground for an excavation or trench
  - Using a laser
  - Using any source of radioactive material
  - Working with lead or asbestos containing materials

Violation of any safety, security, or environmental guidelines may result in the permanent removal of the contractor or their employees from the NC State premises.

4.02 Campus Regulations

The following information is a summary of the key requirements of safety and security that must be observed on the NC State Campus. The contract may impose additional requirements.

- Alcoholic beverages, illegal drugs, explosives, guns, and ammunitions are not permitted on NC State property and are grounds for immediate and permanent dismissal from the worksite.
- Observe the speed limits posted on NC State Campus. Reckless use of vehicles on campus will not be tolerated. Park only in the assigned areas identified by the NC State parking permits.
- Use only those entrances to a building designated by the NC State PM. Emergency exits must not be obstructed and shall be used only in an emergency.
- Contractor employee questions regarding safety requirements shall be addressed to the individual contractor foreman. For further clarification, the Contractor shall contact the NC State PM.

4.03 Telephones

- Use of NC State telephones is not allowed except in an emergency.
4.04 Utility Interruptions

The following information applies to all utilities: water, sprinklers, electricity, chilled water, lab ventilation, fire alarm disconnect, steam, gas and other key utilities that have safety impacts.

- When a utility interruption is required, the Contractor is responsible for determining the type of interruption(s) that needs to be performed.
- Review the project specifications for the minimum amount of prior notice in the amount of working days that should be allowed to process a utility interruption request.
- The Contractor shall submit the request to the NC State PM, who will process the request through the NC State Customer Service Center.
- Upon receipt of the paperwork, the Customer Service Center will process and perform all notifications for the utility interruption(s). Upon completion of the notification process, the Customer Service Center will mail (electronically and/or via campus mail) a confirmation of the pending utility interruption(s) to all affected parties.
- The NC State PM will notify the Contractor.
- Upon completion of the work, the Contractor will notify the NC State PM.

Contractors are reminded that the NC State Campus activities involve many inter-related activities that are often scheduled a year in advance. It requires a costly and time-consuming effort to coordinate the cancellation/rescheduling of these activities. It is impossible to always approve contractor requested times.

4.05 Hotwork Permits

HOTWORK PERMITS AT NC STATE UNIVERSITY
August 20, 2000

I. When a Hotwork Permit is required:

A Hotwork Permit is required when any indoor or outdoor work will involve Hotwork, defined as use of flame, welding, soldering, cutting, brazing, grinding that causes sparks, use of asphalt or tar kettles, or other work that might create sufficient heat or spark to start a fire. Requirements for Contractors performing this work are contained in a 4-page document entitled “Hot Work Program” that is a part of the specifications package.

II. Contractor Responsibilities

Ultimate responsibility for site safety lies with the Prime Contractor.

The Prime Contractor is responsible for:
- Notifying all Subcontractors that Hotwork permits are required at NC State.
- Providing adequate parking for Hotwork Subcontractor, and preparing the job site for Hotwork inspection by NC State Fire Protection, including clearing the work area of unsafe materials in advance of the subcontractor who will perform the Hotwork.

The Hotwork Subcontractor who actually performs the Hotwork is responsible for:
- Coordinating with NC State PM and the NC State Fire Protection for the Hotwork site inspection and impending Hotwork.
- Obtaining the actual Hotwork permit by having his/her equipment available for inspection.

III. How to obtain a Hotwork Permit:

To obtain a Hotwork permit, ALL fire safety equipment and equipment to be used for the Hotwork MUST be on site and available for inspection. When the Contractor feels ready for inspection, he/she should contact NC State Fire Protection at 515-2568 (backup number is 515-3000) to arrange for a Fire Marshall to perform an inspection. Normally a Marshall will arrive in 15-30 minutes. If a Fire Marshall does not arrive in a timely manner, the Contractor should contact the NC State PM.

The Fire Marshall will study the work site, looking for safety hazards such as flammable liquids and chemicals, combustible materials, and other safety hazards. He/she will ask to see that the correct type and size of fire extinguishers are immediately available, and may ask to inspect the welding equipment for proper sizing and state of repair. He/she will look for nearby fire alarms and/or suppression systems that may need to be temporarily protected or shrouded. If the site passes inspection, a Hotwork Permit will be issued on the spot, and must then be posted in a conspicuous place at the job site at all times that Hotwork is performed.

Note: If work requires the disabling of Fire Protection Devices, then the Prime Contractor must request a Fire Alarm Disconnect from the NC State PM, a minimum of 3 WORKING DAYS prior to the shutdown. The Project Manager will coordinate a shutdown through NC State Electronics, Fire Protection, and Facilities Operations.

IV. Contractor’s Checklist to Prepare for a Hotwork Fire Inspection:

- Fire extinguishers of the correct ABC type, with a minimum 2A10BC rating, must be easily accessible and located with 15 unobstructed feet of the Hotwork. Type and size of fire extinguishers are determined DIRECTLY by the type of materials on site (ex: flammable liquids or chemicals in the area).
- Properly functioning and maintained welding equipment that meets manufacturer recommendations.
- Certified welder’s certificate, if applicable, for the person doing the Hotwork.
- No flammable liquids or chemicals are within 50 feet of Hotwork.
- Any combustible materials that can be moved must be located at least 35 feet away from Hotwork area. If any combustible materials cannot be moved, a second person is required to act as a FireWatcher when Hotwork is being
done. Varying situations may require additional measures, as directed by the Fire Marshall.
- Fire resistant shields are available to cover any combustible materials that cannot be moved.
- Check for any fire alarms, smoke detectors, or sprinkler heads that could be set off by the Hotwork.
- Immediate access to telephone or working cell phone capable of calling the NC State emergency line at 515-3333.
- A copy of the Hotwork Program is available on site. Contractors must read the NC State Hotwork Program to determine exact program requirements.

4.06 On-Site Reference Materials
The following reference materials are required to be on every job site for all Contractors and Subcontractors:
- NC State Construction Safety Guidebook.
- NC State Environmental Health and Safety Manual (http://www.ncsu.edu/ehs/healthsafety_man.htm)
- OSHA Regulations published by NC Department of Labor (DOL) (NOTE Available at: (800) NC-LABOR, http://www.nclabor.com/pubs.htm).
- Material Safety Data Sheets (MSDS) for all chemical products the contractor has brought to the worksite.
- The written safety plan of the Contractor or Subcontractor.

4.07 Safety Representative
- The Contractor shall perform daily job inspections and correct any unsafe conditions.
- Any accidents or near misses must be reported and investigated with the results given to the NC State PM.
- The Contractor shall address safety at his regularly scheduled meetings with subcontractors.

4.08 Safety Plans
- Prior to any work being started on any campus facility or property, the contractor shall have available for the NC State PM a written safety plan that will govern the safety conduct of each employee working for this contractor.
- The plan shall effectively address the requirements of all applicable OSHA work and safety rules appropriate to the work involved in or associated with the contract.
- The written plan shall be considered part of the contract for the work and the contractor shall be accountable and responsible for following and enforcing the plan and all provisions of the plan.
- OSHA regulations require that a member of each crew be trained in first aid procedures when medical assistance is not reasonably accessible in terms of time and distance.

4.09 Construction Contract References
- Certain installations must be inspected and approved by the State of North Carolina Department of Insurance (DOI) and the DOL. It is the Contractors responsibility to notify and schedule all required inspections at the appropriate phase of construction with the DOI inspector in a timely manner to support the projects schedule and milestones to completion date for their project. NC State PM will not process final payment invoices until the DOI and the DOL approved inspection documentation is received by the NC State PM.
  - Electrical Inspections
  - Elevator Inspections
  - Fire Alarm/Protection Inspections
  - Sprinkler System

5.0 NCSU special requirements
This section is a listing of NCSU specific requirements above and beyond those requirements as noted in OSHA regulations. The Section # matches those in the "Contractor's Safety Reference Document" in the Appendix (see for full description).

5.02 Asbestos
Many buildings and structures at NC State contain asbestos. Asbestos-containing materials (ACM) can be found in thermal insulation, floor tiles, ceiling tiles, ceiling plaster and other construction materials. Asbestos-containing insulation can be found on steam and condensate piping and also on chilled water, hot water and domestic water pipes. Building Survey reports are available by contacting your NC State PM and should be checked unless it is known that materials to be disturbed are asbestos-free. Contractors must ensure that asbestos-containing materials are not disturbed by their activities. If asbestos-containing materials are accidentally disturbed or a material is questionable, the NC State PM must be notified immediately. Do not attempt to remove the material. The NC State PM will contact NC State Environmental Health & Safety Center at 515-7915 for further assistance or if additional testing is required.

5.03 Barricades and Guardrails
- Barricades, guardrails and covers must be replaced immediately at the end of the work shift and after work is completed.

5.04 Compressed Gas Cylinders
- If a leak develops in a cylinder and it cannot be immediately corrected, the cylinder must be removed to a safe location outside of the building. Strict attention must be paid to all ignition sources when dealing with flammable gas cylinders leaks. Report the incident by dialing the NC State emergency phone number 911. Notify the NC State PM.

5.05 Confined Space Entry
- All contractors and their employees must adhere to OSHA Regulations and the NC State Environmental Health and Safety Manual.
- All contractors required to enter a NC State confined space must:
5.13 Environmental and Chemical Requirements

- Not allow their employees or subcontractors to enter a PRCS without having received confined space training and instruction in their individual duties.
- Have a written PRCS Entry Program and Permit system that is in compliance with OSHA regulations.
- Complete and sign the Contractor's PRCS Affirmation and return it to the NC State PM.
- Coordinate entry operations with the NC State PM when both NC State personnel and contractor personnel will be working in or near permit spaces.
- Inform the NC State PM of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation.
- Upon request provide a copy of the entry permit used for entry.

Procedures for confined space work must meet or exceed the minimum requirements for contractor entry into NC State Confined Spaces as listed in the Contractor Entry section of the NC State Environmental Health and Safety Manual.

5.07 Cranes, Derricks and Hoists

- Notify NC State PM 10 working days prior to the use of cranes.
- The contractor must insure that the equipment will not cause damage to the parking lots, bricked areas, underground facilities or any NC State property due to weight.
- The equipment set-up will not block building exits or roads unless prior approval is received from the NC State PM.

5.11 Emergency Equipment

- NC State fire or emergency equipment shall not be moved, blocked or otherwise rendered inaccessible unless authorized by the NC State Fire Department and the NC State PM.
- First aid equipment, fire blankets, stretchers, eyewash fountains and safety showers must not be moved, modified or disabled without authorization from the NC State PM.
- Fire protection and detection systems must not be moved, modified or disabled without authorization from the NC State PM.

5.12 Emergency Medical Treatment

To receive the immediate assistance for emergency medical treatment, please call NC State Department of Public Safety by dialing 911. To directly inform the City of Raleigh of the incident is an additional means to provide emergency medical treatment. Please inform 515-3000 if this option is taken. Notify NC State PM.

5.13 Environmental and Chemical Requirements

- Contractors must provide NC State PM with a list of all chemicals to be used on NC State property and maintain a copy on site of the MSDS (OSHA Form 20 or equivalent) for each chemical prior to being brought on site. Where construction activities are performed in occupied buildings or near building air intakes, the contractor will review proposed use of volatile materials with the NC State PM prior to use to determine appropriate schedules and precautions.
- Each chemical container to be brought on NC State premises must be labeled clearly with the identity of the chemical and any associated hazards.
- Contractors must follow the safety procedures recommended by the manufacturer or seller of any chemicals, tools, equipment, or other materials used on NC State premises. These procedures must include (but not limited to) those set forth in the MSDS, described in literature distributed with the items, described in labels attached to the items or their containers, as well as specified schedule or application changes as stated by the NC State PM. Additionally, NC State will share chemical identification & MSDS for each chemical owned by NC State in the direct vicinity of the work.
- Contractors must ensure the safe use and legal disposal of any chemicals, tools, equipment, or other materials with which they work. No chemical and/or chemical waste product shall be disposed of on NC State property. Contractors are to remove all empty containers and excess chemicals from NC State property.
- All chemical incidents including spills, fire, explosions, adverse reactions, or injuries must be reported by dialing the NC State emergency phone number 911. Notify the NC State PM.

5.14 Excavation and Trenches

- The Contractor must determine services and utilities by calling “Dig Safely” (1-800-632-4949). 48 working hours prior to the start of the digging, or contacting the utility locator if required. The NC State PM will contact the Facilities Planning and Design Surveyor to review the campus as-built drawings to determine the existence of NC State underground services and utilities at the excavation locations.

5.17 Explosives

- Generally, the use of explosives is not allowed on NC State construction projects.
- A blasting plan must be provided to, reviewed by and approved in writing by the NC State PM.

5.19 Fire Protection and Prevention

- If work requires the disabling of Fire Protection Devices, then the Contractor must request a Fire Alarm Disconnect from the NC State PM a minimum of days as shown in the project specifications prior to the shutdown. The NC State PM will
coordinate a shutdown through NC State Electronics, Fire Protection, and Facilities Operations. No alarm shall be
disabled at anytime by the Contractor.

5.21 Housekeeping
• The Contractor must maintain a clean and orderly project site. The Contractor shall maintain NC State’s pathways
free of rocks, mud, and other miscellaneous construction debris. The Contractor shall prevent the accumulation of dirt,
dust, and / or other debris on NC State’s roadways. The Contractor shall clean the travel ways on a daily basis. (Refer to
project specifications for requirements.)

5.25 Lead
Lead may be found in certain painted surfaces.
• A check for lead presence should be conducted prior to certain activities such as grinding, sanding, or burning over
painted surfaces. If lead containing paint is accidentally disturbed or a material is questionable the NC State PM must be
notified immediately. Do not attempt to remove the material. The NC State PM will contact NC State Environmental
Health & Safety Center at 515-7915 for further assistance or if additional testing is required.
• Hotwork over lead painted surfaces is generally not permitted.

5.28 Noise/Vibration
• Noise producing equipment, such as power drills, jackhammers, welders, etc., can create sound levels of 80dB(A) or
greater in and around a construction area. Notify in advance the NC State PM to determine the appropriate times to be
operating high noise/vibration equipment for that project’s location.

5.32 Powder-Actuated Tools
• Powder-actuated tools are not to be used on NC State property unless specific approval is obtained from the NC State
PM prior to usage.

5.33 Power Vehicle Equipment
• Only trained operators are allowed to use power vehicles on NC State property. Contractor management will be expected
to provide proof of training if requested.
• Generally, LP gas powered trucks are not to be used inside NC State buildings. Prior approval from the NC State PM is
required for exceptions.
• The design of the LP gas fueled industrial truck for use within NC State buildings must comply with the following:
  ➢ LP gas fueled industrial trucks must comply with NFPA 505-1982.
  ➢ If trucks are continuous use in a populated area, they must be equipped with a catalytic converter.
  ➢ LP gas containers must not exceed the nominal 45 pounds LP gas.
• The following conditions and requirements will govern the use of LP gas fueled vehicles inside the confines of NC State
buildings and structures:
  ➢ LP gas fueled trucks must be removed from the building and parked at the end of each workday and not left unattended
while in use. When the job requiring the truck is complete, the truck must be removed from the job site.
  ➢ Trucks and tanks must not be refueled inside buildings.
  ➢ All areas where LP gas fueled trucks are used must be well ventilated.
  ➢ All LP cylinders must be stored outside and secured by a chain in an upright position.

5.34 Roof Safety
• Authorization is required for roof access. The contractor shall request authorization from the NC State PM.

5.38 Smoking and Open Flames
• Smoking is not allowed in any NC State buildings. This includes roofs, penthouses, electrical / mechanical rooms and
basements.
• The use of open flames, where allowed, requires a Hotwork Permit. (See 4.05 Hotwork Permit.)

5.41 Transporting Materials and Equipment
• When moving any item six (6) feet or more in length inside of NC State buildings, two people will carry the item by means
of one person at each end. If carrying the item on a cart, the same rule applies regardless of length. No materials are to
be carried vertically.

5.46 Warning Signs
• All traffic control shall be approved by the NC State PM and meet the Institute for Transportation Research and Education

5.48 All Other OSHA Requirements
All requirements of OSHA will be enforced.
### 6.0 Safety Highlights

(The following listing contains brief summaries of Contract, OSHA, and NC State requirements. Workers should contact their supervisor for details and guidance.)

#### 6.01 Air Tools
- All hand and power tools and similar equipment, whether furnished by the employer or the employee, shall be maintained in a safe condition. Employers shall not issue or permit the use of unsafe hand tools. Any tool found not in proper working order, or that develops a defect during use, shall be immediately removed from service and not used until properly repaired.
- The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded.
- Tools shall not be used in an explosive or flammable atmosphere.
• The use of hoses for hoisting or lowering tools shall not be permitted.
• All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, which operate at more than 100 p.s.i. shall have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.

6.02 Asbestos
Many buildings and structures at NC State contain asbestos. Asbestos-containing materials (ACM) can be found in thermal insulation, floor tiles, ceiling tiles, ceiling plaster and other construction materials. Asbestos-containing insulation can be found on steam and condensate piping and also on chilled water, hot water and domestic water pipes. Building Survey reports are available by contacting your NC State PM and should be checked unless it is known that materials to be disturbed are asbestos-free. Contractors must ensure that asbestos-containing materials are not disturbed by their activities. If asbestos-containing materials are accidentally disturbed or a material is questionable, the NC State PM must be notified immediately. Do not attempt to remove the material. The NC State PM will contact NC State Environmental Health & Safety Center at 515-7915 for further assistance or if additional testing is required.

6.03 Barricades and Guardrails
• Hazardous areas must be cordoned off with barricades or DANGER TAPE to warn workers and non-construction related traffic.
• Stable guardrails consisting of a top rail of 42 inches (+/- 3 inches), mid-rail of 21 inches and toe board of nominal 4 inches must be provided:
  ➢ At all floor edges where workers might fall more than 4 feet.
  ➢ Around all floor or roof openings where a worker might fall more than 4 feet, unless adequate coverings protect such openings.
  ➢ Around the working platform of all scaffolds.
• When barricades, guardrails or opening covers must be removed for work to proceed, workers must be protected by a safety harness and lanyard tied off to a substantial structure member.
• Barricades, guardrails and covers must be replaced immediately at the end of the work shift and after work is completed.

6.04 Compressed Gas Cylinders
• Valve protection caps must be in place when compressed gas cylinders are transported, moved, or stored.
• Cylinder valves must be closed when work is finished and when cylinders are empty or moved.
• All compressed gas cylinders must be secured by chains, straps, or a rigid retaining bar or structure in an upright position at all times. Compressed gas cylinder shall be secured on an approved carrier while being transported.
• Cylinders must be kept at a safe distance or shielded from welding or cutting operations.
• Cylinders must not be placed where they can contact an electrical circuit.
• The proper regulator is required to reduce compressed gases to a safe operating pressure.
• Oxygen and fuel gas regulators must be in proper working order while in use. Back-flow check valves must be installed either at the regulator or the operation torch.
• If a leak develops in a cylinder and it cannot be immediately corrected, the cylinder must be removed to a safe location outside of the building. Strict attention must be paid to all ignition sources when dealing with flammable gas cylinders leaks. Report the incident by dialing the NC State emergency phone number 911. Notify the NC State PM.
• Cylinders will be permanently marked, stenciled, or tagged to identify the “type of gas in the cylinder” per ANSI Standards. The name of the owner of the cylinder must be displayed.

6.05 Confined Space Entry
• All contractors and their employees must adhere to OSHA Regulations and the NC State Environmental Health and Safety Manual.
• An OSHA Permit-Required Confined Space (PRCS) is a confined space that has one or more of the following characteristics:
  ➢ Contains or has the potential to contain a hazardous atmosphere.
  ➢ Contains a material that has the potential for engulfing an entrant.
  ➢ Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a small cross section.
  ➢ Contains any other recognized serious safety or health hazard.
• All contractors required to enter a NC State confined space must:
  ➢ Not allow their employees or subcontractors to enter a PRCS without having received confined space training and instruction in their individual duties.
  ➢ Have a written PRCS Entry Program and Permit system that is in compliance with OSHA regulations.
  ➢ Complete and sign the Contractor’s PRCS Affirmation and return it to the NC State PM.
  ➢ Coordinate entry operations with the NC State PM when both NC State personnel and contractor personnel will be working in or near permit spaces.
  ➢ Inform the NC State PM of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation.
  ➢ Upon request provide a copy of the entry permit used for entry.

Procedures for confined space work must meet or exceed the minimum requirements for contractor entry into NC State Confined Spaces as listed in the Contractor Entry section of the NC State Environmental Health and Safety Manual.
6.06 Contaminated Soil
If soil or any materials appear to be contaminated or questionable, the NC State PM must be notified immediately. Do not attempt to remove the material. The NC State PM will contact NC State Environmental Health & Safety Center at 515-7915 for further assistance.

6.07 Cranes, Derricks and Hoists
- Notify NC State PM 10 working days prior to the use of cranes.
- All operators shall have a third party certification of training, such as CCO, MCOT and be a licensed operator.
- All cranes shall have an annual inspection and a copy of this inspection shall be posted in the cab of the crane. The inspection shall be current.
- No lifts shall occur over occupied spaces.
- Contractor shall provide a uniform, level, and compacted surface for all crane set-ups.
- Contractor shall provide an adequate means of communication with operator, riggers and other cranes on site.
- The contractor must insure that the equipment will not cause damage to the parking lots, bricked areas, underground facilities or any NC State property due to weight.
- The equipment set-up will not block building exits or roads unless prior approval is received from the NC State PM.
- Building areas that are under the equipment operations are to be evacuated and barricaded to all foot and road traffic.
- All contractor employees associated with the lift will wear suitable personal protective equipment, including hard hats.

6.08 Electrical
- Any circuit to be worked on or connected to equipment to be worked on which is capable of being energized must be Locked Out and Tagged prior to work. All electrical installations must comply with the requirements of the NEC.
- Any time operations of a switch lever, etc, would endanger other persons; a “DO NOT OPERATE” tag describing the work must be dated, signed, and attached to the effected electrical equipment. In addition a lock must be attached to the switch and the power to that switch for each worker potentially exposed. Or other methods in compliance w/OSHA safety standards must be used.
- All electrical tools, motors, machinery, and equipment must be grounded, regardless of the voltage. The only exceptions are double-insulated portable tools.
- Each disconnect means (circuit breaker or fuse box) must be legibly marked to indicate its source and purpose. Refer to the project specifications for specific details for labeling requirements.
- All electrical panels, control stations, etc. must have 30 inches or greater clear workspaces in front, as specified in the NEC.
- No work is permitted on energized electrical equipment where contacts or conductors may be exposed or accidental operation equipment operation may occur, or that could affect people, lab experiments, computer operations, or damage to livestock.
- Contractors involved in construction work must use ground fault circuit devices (GFI) Protection or an effective assured equipment-grounding program to protect employees using portable cord and plug connected equipment supplied from 15 or 20 amp, 120-volt receptacles.
- Contractor will follow all requirements as noted in NFPA 70E.

6.09 Electrical Power Lines (Overhead)
- The contractor shall have a trained and knowledgeable observer (flagmen) within sight of the operator and the overhead lines that will effectively provide guidance and clearance information to the operator as the equipment may approach the minimum approach distances. Advising the operator shall be the flagmen’s one and only task.
- When conducting any work with a crane, derrick or hoist in the vicinity of any overhead electric power transmission or distribution line, the contractor shall observe all clearance requirements dictated by all applicable OSHA rules, as specifically contained within 29 CFR 1910 - Standards for General Industry, CFR 1926 - Standards for Construction, IEEE C2 - NEC, NFPA 70 - NEC, the NCSBC, ANSI standards and other applicable NC State safety guidelines and requirements. Further, no crane, derrick or hoist operator or contractor shall conduct any operation at any distance closer than 16 feet to any electric power transmission line lower than 200 kV or closer than 23 feet to any electric power transmission line at voltages higher than 200 kV and lower than 250 kV. Such distances shall be measured from the nearest boundary of the work zone to the nearest conductor, in a straight line.
- The Contractor shall check the approach distance periodically to avoid encroachment of the power line restrictions. The distance may vary throughout the day. The power lines tend to sag more during the summer months and during rain and ice conditions.
- Before equipment is to be utilized on the project site, the equipment should extend its boom, raise its bed, or raise any mechanism that extends the equipment’s height more than usual. If the difference in the extended height of the equipment and the power lines’ lowest point exceeds pass the minimum approach distance set forth above, the Contractor shall designate an alternate route for that equipment during the construction phasing. This should prevent possible errors that could occur while traveling under the power lines. NC State and OSHA expect the Contractor to minimize the amount of time to complete the work near the power lines as much as possible.
- Fuel trucks shall not be parked in the vicinity of any overhead electric power transmission or distribution line.
- No excavation is permitted of any portion of any foundations of the structures or guy anchors which support any overhead high-voltage lines.
- Should any work being conducted in the vicinity of any overhead electric power transmission line encroach on the clearance limits as defined in the OSHA standards or these guidelines, the contractor, the contractor’s job superintendent or the authorized observer shall have the authority and the responsibility to immediately stop the work being conducted or stop the operation of any equipment or vehicles that have encroached on the clearance limits. An incident may result in...
6.10 Elevators/Material Hoists
- Any persons operating elevators/hoists must be trained to do so. Documentation shall be kept onsite.
- No elevator/hoist with a defect shall be used.
- Elevator/hoist safety devices shall not be overridden or made inoperable.
- Elevators/hoists shall be thoroughly inspected at intervals not exceeding one year. Designated persons shall conduct additional monthly inspections for satisfactory operation. Records of the results of the latest annual inspections shall be posted in the apparatus.
- Landing openings shall be provided with doors, gates or equivalent protection that shall be in place when the elevator is in operation.
- Maximum load limits shall be posted and not exceeded. Load limits shall be posted conspicuously both inside and outside of the car.
- No person shall be allowed to ride on a Material Hoist unless allowed by the Manufacturer and then only the operator shall be on board.

6.11 Emergency Equipment
- NC State fire or emergency equipment shall not be moved, blocked or otherwise rendered inaccessible unless authorized by the NC State Fire Department and the NC State PM.
- First aid equipment, fire blankets, stretchers, eyewash fountains and safety showers must not be moved, modified or disabled without authorization from the NC State PM.
- Fire protection and detection systems must not be moved, modified or disabled without authorization from the NC State PM.

6.12 Emergency Medical Treatment
To receive the immediate assistance for emergency medical treatment, please call NC State Department of Public Safety by dialing 911, or by using one of the emergency “blue light” telephones located throughout the campus. Calling 911 to directly inform the City of Raleigh of the incident is an additional means to provide emergency medical treatment. Please inform 515-3000 if this option is taken. Notify NC State PM.

6.13 Environmental and Chemical Requirements
- Contractors must provide NC State PM with a list of all chemicals to be used on NC State property and maintain a copy on site of the MSDS (OSHA Form 20 or equivalent) for each chemical prior to being brought on site. Where construction activities are performed in occupied buildings or near building air intakes, the contractor will review proposed use of volatile materials with the NC State PM prior to use to determine appropriate schedules and precautions.
- Each chemical container to be brought on NC State premises must be labeled clearly with the identity of the chemical and any associated hazards.
- Contractors must follow the safety procedures recommended by the manufacturer or seller of any chemicals, tools, equipment, or other materials used on NC State premises. These procedures must include (but not limited to) those set forth in the MSDS, described in literature distributed with the items, described in labels attached to the items or their containers, as well as specified schedule or application changes as stated by the NC State PM. Additionally, NC State will share chemical identification & MSDS for each chemical owned by NC State in the direct vicinity of the work.
- Each employee who may be “exposed” to hazardous chemicals when working must be provided information and trained prior to initial assignment to work with a hazardous chemical, and whenever the hazard changes. "Exposure" or "exposed" under the rule means that "an employee is subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.) and includes potential (e.g., accidental or possible) exposure."
- Contractors must ensure the safe use and legal disposal of any chemicals, tools, equipment, or other materials with which they work. No chemical and/or chemical waste product shall be disposed of on NC State property. Contractors are to remove all empty containers and excess chemicals from NC State property.
- All chemical incidents including spills, fire, explosions, adverse reactions, or injuries must be reported by dialing the NC State emergency phone number 911. Notify the NC State PM.
- Contractors are solely responsible for containment, clean-up and proper disposal of all removed materials.

6.14 Excavation and Trenches
- Before doing any excavation work, the existence and location of underground utilities must be known.
- The Contractor must determine services and utilities by calling “Dig Safely” (1-800-632-4949). 48 working hours prior to the start of the digging, or contacting the utility locator if required. The NC State PM will contact the Facilities Planning and Design Surveyor to review the campus as-built drawings to determine the existence of NC State underground services and utilities at the excavation locations.
- The walls and faces of all excavations and trenches more than four (4) feet deep must be guarded by shoring, sloping of the ground, or other equivalent means that satisfies OSHA requirements.
- The Contractor must perform daily inspections of excavations and trenches. If there is any possibility of cave-ins or slides, all work in the excavation must cease until safeguards have been taken.
- Trenches more that four (4) feet deep must have ladders or steps located so as to require no more than twenty-five (25) feet of lateral travel between each means of egress.
- When used, timber shoring must be installed progressively as the trench is being excavated (opened).
- The contractor must have designated a “competent person” during excavation.

the permanent removal of the Contractor.
6.15 Excavating Equipment
These rules apply to the following types of earthmoving equipment: scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment. The promulgation of specific rules for compactors and rubber-tired “skid-steer” equipment is reserved pending consideration of standards currently being developed.

- Seat belts shall be provided on all equipment covered by this section and shall meet the requirements of the Society of Automotive Engineers. Seat belts need not be provided for equipment, which does not have rollover protective structure (ROPS) or adequate canopy protection.
- Rollover protective structures (ROPS) and supporting attachment shall meet the minimum criteria detailed in OSHA.
- All earthmoving equipment shall have a service braking system capable of stopping and holding the equipment fully loaded, as specified by the Society of Automotive Engineers.
- All bidirectional machines, such as earthmoving or compacting equipment, and similar equipment, shall be equipped with a signal alarm at an audible level, distinguishable from the surrounding noise, which is operational when the machine is moving in either direction. The signal alarm shall be maintained in an operative condition.
- Unauthorized personnel shall not be permitted to ride on powered industrial trucks. A safe place to ride shall be provided where riding of trucks is authorized.

6.16 Exit Routes
- Exit routes must be maintained during construction, repairs, or alterations.
- Lighting and marking must be adequate and appropriate.
- An employee alarm system must be operable.
- Exit routes must be kept free of explosive or highly flammable furnishings or other decorations.
- Exit routes must be free and unobstructed. No materials or equipment may be placed, either permanently or temporarily, within the exit route. The exit access must not go through a room that can be locked, such as a bathroom, to reach an exit or exit discharge, nor may it lead into a dead-end corridor. Stairs or a ramp must be provided where the exit route is not substantially level. No materials shall be stored in a stairwell.

6.17 Explosives
- Generally, the use of explosives is not allowed on NC State construction projects.
- In the exceptional event that explosives are allowed, blasting must comply with the appropriate OSHA regulations.
- A blasting plan must be provided to, reviewed by and approved in writing by the NC State PM.

6.18 Fall Protection
- Contractors shall provide and install all fall arrest protection systems as required by OSHA.
- The use of a body belt for fall arrest is prohibited.
- Non-locking snap hooks as part of personal arrest systems are prohibited.
- Lanyards/lifelines shall have a minimum breaking strength of 5,000 pounds, and carry an OSHA approved label.
- Lanyards/lifelines shall be rigged such that an employee will not free-fall more than 6 feet and/or contact the lower level.
- Anchorage’s used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5000 pounds for each employee attached.
- Anchorages points shall not deflect greater than 0.04 inches when a force of 2,250 pounds is applied.
- Employees working within 6 feet or less of unprotected sides or edges, which is 10 feet above a lower level, shall be protected from falling. A guardrail system, safety net system, or a personal fall arrest system must be utilized.
- The contractor shall provide training requirements to each employee who might be exposed to fall hazards.

6.19 Fire Protection and Prevention
- The employer shall be responsible for the development and maintenance of an effective fire protection and prevention program at the job site throughout all phases of the construction, repair, alteration, or demolition work. The employer shall ensure the availability of the fire protection and suppression equipment required by OSHA. As fire hazards occur, there shall be no delay in providing the necessary equipment.
- Contractors shall perform inspections on fire extinguishers monthly. Contractors shall immediately replace fire extinguishers that do not pass inspection.
- Fire cutoffs shall be retained in buildings undergoing alterations or demolition until operations necessitate their removal.
- If work requires the disabling of Fire Protection Devices, then the Contractor must request a Fire Alarm Disconnect from the NC State PM a minimum of days as shown in the project specifications prior to the shutdown. The NC State PM will coordinate a shutdown through NC State Electronics, Fire Protection, and Facilities Operations. No alarm shall be disabled at anytime by the Contractor.

6.20 Floor Openings, Hatchways
- Every hatchway and chute floor opening shall be guarded by one of the following:
  - Hinged floor-opening cover of standard strength and construction equipped with standard railings or permanently attached thereto so as to leave only one exposed side. When the opening is not in use, the cover shall be closed or the exposed side shall be guarded at both top and intermediate positions by removable standard railings.
  - A removable railing with toe board on not more than two sides of the opening and fixed standard railings with toe boards on all other exposed sides. The removable railings shall be kept in place when the opening is not in use.
- Where operating conditions necessitate the feeding of material into any hatchway or chute opening, protection shall be provided to prevent a person from falling through the opening.
6.21 Housekeeping

- The Contractor must maintain a clean and orderly project job site. The Contractor shall maintain NC State's pathways free of rocks, mud, and other miscellaneous construction debris. The Contractor shall prevent the accumulation of dirt, dust, and/or other debris on NC State's roadways. The Contractor shall clean the travel ways on a daily basis. (Refer to project specifications for requirements.)
- Waste material and debris must be removed from the work and access areas at least once a day. Waste material and debris should not be thrown from one level to another but should be carried down, lowered in containers or deposited in a disposal chute.
- Materials must be neatly piled, stacked or otherwise stored to prevent tipping or collapsing. Materials must be carefully stacked and located so they do not block aisles, doors, fire extinguishers, safety showers and eye wash stations, fixed ladders or stairways.
- Material to be lifted by crane or other hoisting devices must not be stored under overhead power lines.
- No materials may be stored on penthouses, roofs, or other areas until a specific area is assigned by the NC State PM for a specific project.

6.22 Illumination

- Construction areas, ramps, runways, corridors, offices, shops, and storage areas shall be lit to not less than the minimum illumination intensities required by OSHA while any work is in progress.

6.23 Ladders

- All ladders must meet OSHA requirements.
- Ladders must be free from such defects as loose or broken steps or rungs, cracks, or other weak places in the side rails, broken or frayed ropes on extension ladders and missing or damaged safety feet.
- Ladders must be secured to keep them from shifting, slipping, being knocked over, or blown over by the wind.
- Extension ladders must not be separated. NOTE: Separation eliminates the safety feet from one section and can cause damage to pulleys and catches on the extension section.
- Straight and extension ladders must extend 36 inches (3 rungs) above the landing or level to be accessed.
- Ladders constructed of conductive material such as aluminum and steel are not to be used while working on or near electrical equipment.
- Stepladders must not be used as straight ladders. Do not use the top tie brace as a step.
- When using a ladder, climb the ladder on the front side using both hands.

6.24 Lasers

- Lasers must comply with the OSHA Construction Industry Standards.
- Lasers must be low power (<5mw) devices with visible beams. Lasers to be used must bear a label indicating this maximum power output. Lasers that do not bear this label shall not be used.
- ‘Laser in use’ signs shall be posted according to OSHA requirements.
- Lasers must be used in a manner that will not risk exposure to others.

6.25 Lead

Lead may be found in certain painted surfaces.
- A check for lead presence should be conducted prior to certain activities such as grinding, sanding, or burning over painted surfaces. If lead containing paint is accidentally disturbed or a material is questionable the NC State PM must be notified immediately. Do not attempt to remove the material. The NC State PM will contact NC State Environmental Health & Safety Center at 515-7915 for further assistance or if additional testing is required.
- Hotwork over lead painted surfaces is generally not permitted.

6.26 Lifting

- Before lifting the load, think of alternate means of moving it (push, pull, roll, pour or pump).
- Have firm footing and make sure the standing surface is not slippery.
- Keep your back straight by tucking your chin in.
- Tighten your stomach muscles and lift with your legs.
- Lift the load slowly. DO NOT JERK!
- Hold the load as close to the body as possible. Be sure you position the load close to the body before lifting.
- Do not twist during your lift or when moving the load. Turn with your feet, not with your back.
- Set the load down gently. Use your legs and keep your back as straight as possible.
- Be sure your fingers are out of the way when putting the load down and when moving the load through tight spaces.
- Ask for help if you need it and use mechanical means wherever it’s available.

6.27 Lock Out/Tag Out

- All contractors that work on energized equipment with any hazardous energy source are required to secure the source potential using a LOCKOUT / TAGOUT procedure as required by OSHA. The purpose is to insure contractors or vendors that perform service or maintenance operations are protected from unexpected energizing of equipment start-ups, or release of any form of stored energy that could result in injury. Types of potential energy sources:
  - Electrical - This includes power supplies, batteries, capacitors and static electricity.
  - Hydraulic, air, gas pressure lines and vessels.
  - Thermal energy
  - Elevated materials, coiled springs – These are additional examples of stored energy that must be released, blocked,
or isolated prior to work.

- When contractors are required to implement energy control procedures they are required to notify all affected parties of their lock out procedures (type of locks, tags, devices, etc.).
- When repairs or modifications are complete, the contractor shall verify that all tools and personnel are clear and notify the affected parties that the equipment will be restarted.

Refer to 5.08 Electrical for further clarification.

6.28 Noise/Vibration

- Noise producing equipment, such as power drills, jackhammers, welders, etc., can create sound levels of 80dB(A) or greater in and around a construction area. Notify in advance the NC State PM to determine the appropriate times to be operating high noise/vibration equipment for that project’s location.
- Appropriate personal protective equipment will be used when working around high noise/vibration equipment.

6.29 Overhead Work

- Work must not be performed above other personnel, including other contractor employees. Affected areas must be roped off or barricaded and marked to prohibit traffic.
- Contractors must not climb on the heating and air-conditioning ductwork, plumbing steam piping, electrical cable trays, fixtures, or furniture or use as work platforms.
- Contractors are expected to comply with OSHA fall protection requirements. Raised work platforms will be properly guarded.

6.30 Paints and Solvents

Contractors must provide the following safeguards:

- Adequate ventilation must be maintained at all times when paints or solvents are being used.
- Personnel must use proper respiratory protection and protective clothing when toxicity of the material requires such protection.
- Flammable solvents and materials must be used with extreme caution when possible sources of ignition exist.
- Flammable paints and solvents must be stored in an approved flammable liquid storage cabinet when storage is required inside buildings. Acids and flammables must never be stored together. If an approved flammable liquid storage cabinet is not available, flammable paints and solvents must be removed from the building.
- Flammable liquids must be dispensed in a safety can with a flash screen bearing a Factory Mutual or Underwriters Laboratory (UL) approval.

6.31 Personal Protective Clothing and Equipment

- In certain construction and maintenance operations, personal protective equipment, such as safety glasses, goggles, respirators, hard hats and protective clothing, must be worn. The type of protective equipment to be worn will be determined by the exposure to the potential hazards and proximity to any designated hazard areas.
- All safety equipment shall meet or exceed OSHA standards.
- Contractors shall come to the worksite assuming they will need, as a minimum, eye, head, and foot protection.

Eye protection is always recommended but must be worn when engaging in the following operations:

- Drilling, chipping, grinding, wire brushing, using power actuated tools, or overhead work.
- Handling chemicals (refer to the MSDS for details)
- Breaking/chipping brick or concrete.
- Hammering of chisels, drift pins etc.
- Burning, welding or soldering.
- Any portable power tool operation.
- Other operations that create a possible eye hazard. This will also include working in the same area as coworkers or other trades who are engaged in activities requiring eye protection.

Hard hats are to be worn in all designated CONSTRUCTION AREAS.

Safety shoes are to be worn in all areas where there is exposure to injury to the feet.

6.32 Powder-Actuated Tools

- Powder-actuated tools are not to be used on NC State property unless specific approval is obtained from the NC State PM prior to usage.
- A tool must never be left unattended in a place where it would be available to unauthorized persons. All blank cartridges must be removed each day.
- Powder-actuated tools shall not be used in explosive or flammable atmospheres.
- Contractor operators must be licensed for operating powder actuated tools and have a valid operator’s card at the job site for tools being used.
- The area behind the surface into which the fasteners are being driven is to be evacuated of all personnel and secured with barricades and warning signs.
- Safety glasses, goggles, or face shields are required when using powder-actuated tools.
- Operator and all persons adjacent to operation require hearing protection.
6.33 Power Vehicle Equipment

- Only trained operators are allowed to use power vehicles on NC State property. Contractor management will be expected to provide proof of training if requested.
- Generally, LP gas powered trucks are not to be used inside NC State buildings. Prior approval from the NC State PM is required for exceptions.
- The design of the LP gas fueled industrial truck for use within NC State buildings must comply with the following:
  - LP gas fueled industrial trucks must comply with NFPA 505-1982.
  - If trucks are continuous use in a populated area, they must be equipped with a catalytic converter.
  - LP gas containers must not exceed the nominal 45 pounds LP gas.
- The following conditions and requirements will govern the use of LP gas fueled vehicles inside the confines of NC State buildings and structures:
  - LP gas fueled trucks must be removed from the building and parked at the end of each workday and not left unattended while in use. When the job requiring the truck is complete, the truck must be removed from the job site.
  - Trucks and tanks must not be refueled inside buildings.
  - All areas where LP gas fueled trucks are used must be well ventilated.
  - All LP cylinders must be stored outside and secured by a chain in an upright position.

Safety Rules for Operating Power Vehicles

DO NOT:

- Fail to wear seat belts
- Carry passengers
- Smoke, eat, or drink while driving
- Exceed posted speed limits
- Talk to pedestrians while vehicle is moving
- Elevate anyone unless using an approved verti-lift type vehicle
- Wear radio earphones
- Operate a defective vehicle
- Put arms and legs outside running lines of vehicle
- Drive on slippery floors
- Operate with leaking hydraulic lines
- Travel with load elevated
- Use a vehicle in a reckless manner or for horse play
- Over-fill batteries prior to charging

6.34 Roof Safety

- Authorization is required for roof access. The contractor shall request authorization from the NC State PM.
- At least two contractor employees must be present during all work on roofs.
- During all rooftop operations within 10 feet of the roof edge, the contractor must provide one of the following:
  - A railing along the roof edge that meets OSHA requirements. This railing can be the moveable type, temporarily secured to the building; or
  - An OSHA acceptable safety harness that is secured in a manner that will hold the weight of a falling person. (See 5.18 Fall Protection.)
- Hard hats must be worn at all times when loads are being lifted above the roof and when construction activities overhead threaten personnel on the roof.
- Roofing contractors must meet the appropriate OSHA requirements.
- These requirements do not apply on those buildings with a 42-inch parapet wall when work is to be done within the wall. An exception to these requirements is work which only involves a "walk along inspection" were no tools are needed.
- Two appropriate fire extinguishers of the correct ABC type are required when performing hot work on roofs. Other persons acting as a Fire Watcher shall be in place on the roof and on the floor(s) directly below operation. (See 4.05 Hotwork Permits.)

6.35 Sanitation

- Drinking Water
  - An adequate supply of water, meeting the U.S. Public Health Service Drinking Water Standards, shall be provided in all places of employment.
  - Portable containers used to dispense drinking water shall be capable of being tightly closed, and equipped with a tap. Water shall not be dipped from containers. A waste disposal container shall be in the vicinity of the dispenser.
  - Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.
- Washing Facilities
  - The employer shall provide adequate washing facilities for employees engaged in the application of paints, coating, herbicides, or insecticides, or in other operations where contaminants may be harmful to the employees. Such facilities shall be in near proximity to the worksite and shall be so equipped as to enable employees to remove such substances.
  - Hand soap or similar cleansing agents shall be provided.
  - Individual hand towels, cloth or paper, warm air blowers or clean individual sections of continuous cloth toweling, shall be provided.
- Toilet facilities shall be provided for employees according to the OSHA requirements.
- Designated drinking water stations, food preparation stations, washing facilities, and toilet facilities shall be maintained in
a sanitary manner.
• Provide a waste receptacle that is in good condition and appropriate for the type of waste material. Place trash in proper receptacle. Do not throw it on the floor or ground.
• Oily waste, rags or other flammable material shall only be stored in the proper metal receptacles.
• Provide adequate fresh airflow in work area.

6.36 Scaffoldings
• The erection and dismantling of scaffolding shall be carried out under the supervision of personnel knowledgeable and experienced in such operations.
• Scaffolds shall be erected with all braces, pins, screw jacks, base plates and other fittings installed as required by the manufacturer.
• Scaffolds shall be braced as per manufacturer’s requirements in both the horizontal and vertical directions. Tubular frame scaffolding should have braces on both sides of each section in the vertical plane. Where scaffolds are several sections high or when they are on casters, manufacturers recommend that horizontal bracing shall be used.
• Scaffold platforms shall be at least 18 inches wide and if over 8 feet in height, they shall be planked across their full width.
• Scaffolds shall be equipped with guardrails consisting of a top rail, not less than 36 inches or more than 42 inches high, with mid-rails and toe boards.
• Scaffolds shall be properly secured to the building at vertical intervals not exceeding three times the least lateral dimension, including the dimension of any outrigger stabilizing devices.
• Where scaffolds cannot be secured to the building, guide wires that are adequately secured should be used to provide stability.
• Scaffold frames should be pinned together where scaffolds are over two frames in height or where they are used as a rolling scaffold.
• Scaffold planks shall be securely fastened to prevent them from sliding.
• Scaffold planks shall be of good quality, free of defects such as loose knots, splits, rot or rough edges. The planks shall measure 2 inches by 10 inches in cross section and be No. 1 spruce or better when new.
• Scaffolds shall be erected, used and maintained in a reasonably plumb condition.
• Scaffolds shall be installed so that they overhang by at least 6 inches, but no more than 12 inches.
• Scaffolds shall be equipped with a proper ladder for access.
• Ice, snow, oil, grease and other slippery materials shall be removed from the platform and the surface shall be sanded.
• Wheels or casters on rolling scaffolds shall be equipped with braking devices and securely pinned to the scaffold frame.
• Boards used to level scaffolding shall be 2" x 8" x 8" and shall not be stacked.
• All workers shall be trained to recognize the hazards associated with working on scaffolds. Documentation shall be made available upon request.

6.37 Signs and Barriers
• Adequate signs and barriers shall be used where hazards exist.
• All holes shall be covered, secured, and properly marked.

6.38 Smoking and Open Flames
• Smoking is not allowed in any NC State buildings. This includes roofs, penthouses, electrical / mechanical rooms and basements.
• The use of open flames is strictly prohibited in areas where flammable liquids, gases, or highly combustible materials are stored, handled or processed.
• The use of open flames, where allowed, requires a Hotwork Permit. (See 4.05 Hotwork Permit.)

6.39 Tarpaulins
• When tarpaulins are required for the deflection of hot slag, dust, paint drippings, etc., or as a security barrier, they must be flame resistant and in good condition, free of holes and worn edges.

6.40 Tar Pots (tar kettles)
• Tar Pots are not allowed on roofs.
• Each pot must have a minimum 40-BC fire extinguisher readily available (within 25 ft of the pot). An identical extinguisher must be available on the roof being covered.
• Tar Pots must be kept at least 20 feet from any building door, window, or combustible building surface. Where this is not possible, shielding may be used as approved by NC State Fire Protection.
• The contractor must obtain a Hotwork permit for tar pot operation by proper notification to the NC State PM. (See 4.05 Hotwork Permit.)
• The tar pot must be attended by a person who is constantly within sight and within 100 feet of unobstructed access (no barriers, ladders, scaffolds, etc in between) to the pot at all times.

6.41 Transporting Materials and Equipment
• When moving any item six (6) feet or more in length inside of NC State buildings, two people will carry the item by means of one person at each end. If carrying the item on a cart, the same rule applies regardless of length. No materials are to be carried vertically.
• Contractors’ carts, tools, materials and equipment must not be left unattended in aisles or stairways.
6.42 Temporary Heating
- When heaters are used in confined spaces, special care shall be taken to provide sufficient ventilation in order to ensure proper combustion, maintain the health and safety of workmen, and limit temperature rise in the area.

6.43 Temporary Lighting
- Contractor shall submit a lighting plan for night work, underground work, and any other work sites without adequate lighting.

6.44 Vehicle Operation
- All equipment shall have operational backup alarms. Equipment shall not be utilized until such device is functioning properly.
- All drivers shall be properly licensed.
- Supervisors shall verify that drivers are capable and qualified on each type of vehicle before allowing the vehicle to be operated unsupervised.
- Drivers shall perform a pre-operational check of their vehicle and be familiar with the operator's manual.
- No vehicle shall be operated in an unsafe condition.
- Drive defensively, observe speed limits and obey all traffic laws when operating vehicles.
- Radio headphones are prohibited.
- Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing.
- Choose safest location possible to park vehicles. Avoid parking in other vehicles' blind spots.
- Keep windshield, windshield wipers, side windows and mirrors clean.
- Clean headlights, taillights and emergency light covers.
- Remove key from unattended vehicles.
- Vehicle should not be left running when unattended.

6.45 Vertical Lifts
- All contractors’ platforms or vertical lifts must meet the following requirements:
  - The vehicle must have a method to prevent free descent in case of a hydraulic, pneumatic, electrical, or electromechanical failure.
  - The vehicle must have an emergency stop located at the control station or on the portable control box.
  - A work platform with a power-elevated assembly must have a clearly marked means of emergency lowering located at the ground level.
  - Each vehicle should be equipped with a mechanical braking method. If not, the fully extended outriggers can act as a brake. Otherwise, the unit must be chocked.
- Requirements for outriggers or stabilizers are related to the width of the base dimension:
  - Some vehicles will have a wide base dimension and will not require stabilizers. These can be elevated to approximately four times the wheel track width.
  - Outriggers or stabilizers are required on narrow base type man-lifts unless specified on the equipment by the manufacturer.
  - Vehicles must have an interlocking means to prevent horizontal travel when the platform-elevated height exceeds the stability height designated by the manufacturer. This information should be noted on the lift. If not, the platform must be lowered fully before travel.
- Moving the platform:
  - If equipped with a horn, the operator can move the vehicle in a fully lowered position. If there is no horn, another person is required on the ground when moving the platform.
  - If the platform is to be moved while elevated, the contractor must provide another employee on the ground to guide the vehicle. They must ensure that there is no debris or holes on the floor surface that can impede or hinder the movement of the lift.
- Entrance to the work platform requires a chain or self-closing gate. This device must be in place and secured prior to elevating or moving the vehicle.
- Each vehicle should have a load rating plate stating the maximum permissible load.
- The platform should have a non-skid surface and be clear of debris.
- Platform railing should be 42 inches high with an intermediate toe board of three to four inches high.
- Any extension cords to bring power to the platform must have a grounded three-prong cord and receptacle.
- The vehicle’s tires must be free of gouges and cuts.
- Requirements for the operator:
  - Only trained and authorized personnel will be permitted to operate the vehicle.
  - No more than two persons should be on the platform at any time.
  - Personnel must remain within the confines of the work platform. No sitting or standing on the railings will be allowed.
  - Safety cones should be placed approximately eight feet in front of and behind the vehicle and at least two feet on each side when working in the aisles.
  - No smoking, eating, or drinking is allowed while on the platform.
  - Operators must inspect the vehicle on a daily basis for hydraulic leaks, damaged control cables, loose wire and connections, cracked wheels, tire damage and clean the platform prior to use.

6.46 Warning Signs
- All traffic control shall be approved by the NC State PM and meet the Institute for Transportation Research and Education

- Warning, safety and security signs shall be obeyed.
- The contractor shall provide warning signs, barriers, barricades, etc., whenever such protection is needed.
- Where signs and barricades do not provide adequate protection, particularly along a road, walkway, or main aisle, flagmen shall be used.
- Review with the crew, each person's responsibility regarding the traffic control set-up (e.g. sign installation, lane closure setup, etc.).
- Review traffic control devices to be used at the site. Assure that traffic control set-up is properly installed. Installer shall document what traffic control set-up was used (including the sign types and sign locations) and how it was installed.

6.47 Work Zone Tail Gate Safety Meetings

- “Tailgate” or “toolbox” safety meetings shall be held at the beginning of each work period (normally in the morning before leaving the yard or work staging area) and as conditions change from job site to job site or activity changes.
- The crew leader or the senior man for the crew shall conduct these meetings. This individual shall have appropriate training.
- Describe to the crew the work that is likely to be performed.
- Review and discuss with the crew all safe operating procedures (SOPs) that relate to the work to be performed.

6.48 All Other OSHA Requirements

All requirements of OSHA will be enforced.
SAFETY FIRST

Prepare for emergencies in advance. Primary attention is injury prevention through the use of safe work practices and the use of protective equipment. Consider the additional potential injury/illness factors involved with your work. For example...

Working in Hot Environments – Heat Stress – Have plenty of drinking water available as well as use of other heat stress prevention methods.

Working with Corrosive Materials – Skin, Body, Eye Contact – If working in an area where eyewash or safety shower is not readily accessible, provide portable flush facilities for emergency irrigation of contacted areas. Remember that review of the MSDS and use of protective clothing is the first step in prevention of exposure.

Have a first aid kit readily available.

All Contractors shall provide an emergency contact directory for all responsible contract personnel. Minimum requirements shall include: Project Manager, Superintendent, Assistant Superintendent, Safety Manager, Main office, after hour’s number. Each individual shall include his/her office, mobile, and home phone numbers.

The information provided in this manual does not provide all of the information needed to keep you free of injury or illness. It is the responsibility of you and your company to review potential hazards, regulations, and necessary work practices and protective equipment for your job.

North Carolina State University
Emergency Procedures

Keep a first aid kit handy

CALL 911 for any Emergency

Fire
Medical Emergency
Injury Requiring Medical Assistance
Spills / Leaks
Other Emergencies

Provide your type of emergency, name, company, location, and callback phone number if available. Send someone to meet the emergency responder at the building entrance. Next, send someone to notify your foreman or supervisor to inform him or her of the situation. The foreman or supervisor should also alert the NC State PM.

Construction Management Department
Facilities Division
North Carolina State University
(919) 515-6380

The following sources were used in compiling the contents of this guidebook:
- OSHA 29 CFR 1910 NC OSHA Standards for General Industry
- OSHA 29 CFR 1926 NC OSHA Standards for Construction
- National Electrical Code (NEC)
- National Fire Protection Association (NFPA)
- North Carolina State Building Code (NCSBC)
- American National Standards Institute (ANSI)
- NC State Environmental Health and Safety Manual
- NC State Environmental Management Plan
- Carolinas AGC Construction Safety and Health Manual
- NC Department of Transportation Workplace Safety Manual