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The purpose of this manual is to aid the Department of Transportation in creating a safety climate that will not tolerate accidents and injuries. To accomplish this the manual has been divided into a program section and a procedures section.

The program portion of this manual will detail a line organization safety structure within the Department of Transportation. This safety structure will be responsible for implementing the safety program as it is written.

Chapter 1 Introduction
Chapter 2 Generic Program
Chapter 3 Division of Highways – Operations
Chapter 4 Division of Highways – DOH-Preconstruction
Chapter 5 Division of Motor Vehicles
Chapter 6 Ferry Division
Chapter 7 Forms

The procedures portion of the manual is designed to tell employees how to do their jobs safely. They are intended to comply with all applicable local, state and federal laws. All laws should be strictly adhered to in the case of conflicts between this manual and the laws.

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Chapter 9 Departmental Listings
Chapter 10 SOPs – General
Chapter 11 SOPs – Work Sites and Work Activities
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<td>Rip Rap Installation/Removal</td>
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<td>Roadside Equipment Repair</td>
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<td>Roadway Inspection</td>
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<td>Sampling and Inspection at Producer's Facility</td>
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<td>Seeding, Mulching and Topdressing</td>
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<td>Sign Installation/Maintenance</td>
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<td>Special Markings Installation</td>
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<td>Towing Disabled Equipment</td>
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<td>Traffic Signal Installation/Maintenance</td>
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<td>Tug Operations</td>
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<td>Traffic Signal Cabinet Work</td>
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<td>Field Data Collection Safety/Horizontal Curves</td>
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<td><strong>C:</strong> Field – DMV</td>
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<td>Behind the Wheel Training of School Bus Drivers</td>
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<td>Construction Safety Emphasis Areas</td>
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**Chapter 12 SOPs – Equipment**

**A:** Self Propelled

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<td>Truck, Sign Erector</td>
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<td>ATVs / UTVs</td>
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**B. Tools and Accessories**

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<td>Attenuator, Truck Mounted</td>
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<td>Chain Saw</td>
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<td>Compactor, Hand Operated</td>
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<td>Concrete Mixer</td>
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<td>Concrete Pump</td>
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<td>Concrete Saw</td>
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<td>Conveyor</td>
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<td>Curb Machine</td>
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<td>Fumigation (Gassing) Rig</td>
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<tr>
<td>Generator</td>
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<tr>
<td>Hand Tools (Power and Manual)</td>
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<td>Impactor-Asphalt Cutter</td>
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<td>Ladder</td>
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<td>Line Remover, Traffic Paint</td>
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<td>Mulch Blower</td>
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<td>Pavement Breaker / Jack Hammer</td>
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<td>Tractor Attachments</td>
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<td>Water Pump</td>
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<td>Pole Saw/Pruner</td>
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<td>Storm Drain Cleaning with Trailer Jet</td>
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<td>Salt Brine Tank Applicator</td>
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<td>String Trimmer/Brush Cutter</td>
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Secretary’s Safety Message

The North Carolina Department of Transportation is committed to protecting employees, subcontractors, clients and the public from injuries and occupational illness both on and off the job. This premise is an agency value of greatest importance. We are committed to a goal of ZERO injuries and incidents by a belief that all injuries and occupational illnesses are preventable, and by providing a safe and healthful work environment for all our employees. Operating safely, with constant focus on accident prevention, occupational health, and operational risk management is the most efficient way to manage our business.

This philosophy and our ability to sustain this process will be evidenced by the following guiding principles:

• Senior management is responsible to support and monitor the safety, health and operational risk management process.

• The line organization is responsible and accountable to lead and implement the safety, health, and risk management process.

• Supervisors shall possess the skills and competencies commensurate with project safety, health, and risk management responsibilities.

• All employees must comply with safety, health, and risk management requirements and accept that working safely is a condition of employment.

• We will accomplish our work utilizing effective accident prevention strategies such as safety engineering and design, training, people based safety, and administrative controls to safeguard against workplace hazards.

• We will work towards continuous improvement.

• We will foster a culture that aligns safety, health and risk management with the other business objectives of NCDOT.

• We will conduct our business in compliance with all regulatory requirements.

• The emphasis will be on Safety, Health, and Risk Management Planning Process and the reduction of incidents will be the measure of our success.

MG(R) James H. Trogeon, III, PE
Secretary

February 2, 2017
1. All accidents and injuries can be prevented.

2. Management/supervisors are responsible, and will be held accountable, for preventing injuries and occupational illnesses.

3. Occupational safety and health is part of every employee’s total job performance.

4. Working safely is a condition of employment.

5. All workplace hazards can be safeguarded.

6. Training employees to work safely is essential and is the responsibility of management/supervision.

7. Prevention of personal injuries and accidents is good business.
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DEPARTMENTAL GOALS

SHORT TERM GOALS

(0 – 1 YEAR)

1. Develop safety standards
2. Develop continuing safety training
3. Develop a continuous resource commitment
4. Keep up with Research & Development safety efforts
5. Equipment acquisition to enhance safety
6. Safety modification of equipment
7. Safeguard and prioritize hazards
8. Comprehensive structured program
9. Formalize training program
10. Make necessary changes in personnel system
11. Establish limited incentive/reward program
12. Reorganize safety unit
13. Improve off-the-job safety
14. Change operating procedures with safety in mind
15. Reduce accident and injury rates by 20%
16. Reduce Worker’s Compensation by 20%
17. Increase employee safety awareness

INTERMEDIATE GOALS

(1 – 3 YEARS)

1. Instill a safety attitude
2. Total line supervisor commitment
3. Develop safety standards and procedures
4. Develop continuing safety training safety efforts
5. Keep up with Research and Development safety efforts
6. Equipment acquisition to enhance safety
7. Safety modification of equipment
8. Safeguard hazards
9. Make necessary changes in personnel system
10. Improve off-the-job safety
11. Reduce accident and injury rates by 50%
a. Accidents: number and costs
b. Lost work days, incidence rate
12. Reduce Worker’s Compensation claims by 50%

LONG TERM GOALS

(4 years+)

1. Zero accidents and zero injuries
2. Develop continuing safety training
3. Develop a continuous resource commitment
4. Keep up with research and development safety efforts
5. More equipment acquisition to enhance safety
6. Safety modification of equipment
7. Safeguard hazards
8. Eliminate Worker’s Compensation expenditures
9. Establish a complete incentive/reward program
10. Instill a safety climate
I. POLICY:

It is hereby declared that the North Carolina Department of Transportation fully subscribes to General Statute 95, Article 16, known as the Occupational Safety and Health Act of North Carolina.

It is further declared that the Department of Transportation through the exercise of its powers shall assure so far as possible every employee in the Department safe and healthful working conditions as provided in the Act.

The rights and duties of employers and employees as described in the Act shall henceforth become a part of the rules and regulations of this Department.

It is further declared that this Department of Transportation will pursue a vigorous and diligent effort to achieve full compliance with the Act and will commit such resources as required to fully perform the responsibilities assigned to State Agencies as described in the Act.

Employees are hereby guaranteed the exercise of their rights under the Occupational Safety and Health Act without being subjected to any retaliation whatsoever. These rights include the right to register complaints about unsafe working conditions; the right to be fully informed about disposition of complaints; and the right to be fully advised about violations of safety standards. These rights also include the right to participate in the safety program and to be represented at safety inspections.

II. SUPERVISOR RESPONSIBILITY:

It shall be the basic responsibility of each supervisor to plan and conduct safe operations. It shall be the duty and responsibility of each supervisor to fully orient and instruct all employees in safe practices and procedures. Supervisors shall immediately take necessary corrective action to prevent recurrence or initiate such action as deemed necessary to correct any unsafe act or condition reported or observed.

III. EMPLOYEE RESPONSIBILITY:

It shall be the responsibility of each employee to abide by all Department rules and regulations and to comply with all laws pertaining to employee safety and health. Unsafe acts or conditions observed by any employee shall be reported immediately to the responsible supervisor.

IV. CONTRACTING AGENCY RESPONSIBILITY:

It shall be the policy for all owner-contracting agencies within the Department of Transportation to cooperate fully with State and Federal Agencies to assure contractor compliance with the Occupational Safety and Health Act, alert these agencies of any observed serious violations, and to utilize such sanctions as are consistent with contract terms in assisting the responsible agency in enforcing laws, rules, and regulations.
CARDINAL RULES

These offenses may be grounds for dismissal:

- Failure to report all incidents (accidents, injuries and near misses) immediately
- Possession or use of illicit drugs or alcohol
- Possession of firearms
- Malicious destruction of NCDOT property
- Fighting or horseplay
- Falsification of NCDOT safety documents
Chapter 1
Introduction to the Program

In order to have an effective safety program and reduce accidents and occupational illnesses, each person must be responsible for safety. All line managers and supervisors are expected to take an active role in safety. This involvement by management shows concern for our employees’ well being. Employees are encouraged to report any safety and health problems without fear of retaliation by management.

Management involvement will be accomplished through the structured program established herein. This program will consist of safety committees made up of top management, safety meetings, audits and incident investigations throughout all levels of the organization.

A generic program has been established for the Secretary and the immediate staff, Personnel, Aviation, Civil Rights, Public Transportation, Bicycle, all units reporting to both Assistant Secretaries, Public Affairs, the Governor’s Highway Safety Program and all office-related sections of the Division of Motor Vehicles. Within the Division of Highways, this program will be used by all units reporting to the Chief Engineer for Programs and the office oriented units under the Chief Engineer for Preconstruction.

Division of Highways Operations groups, field units of Preconstruction, Division of Motor Vehicles and the Ferry Division have unique safety concerns that are not addressed in the generic program; therefore, specific programs have been developed for these units.
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Chapter 2
Generic Program

A) Safety Committees

The safety committees will consist of line organization personnel with Safety and Loss Control acting as a support organization. Each committee will be comprised of top managers in a section and will refer findings up the committee structure. Each committee will be responsible for:

1. Originating, modifying, coordinating and guiding the safety program.
2. Approving the safety policies.
3. Exchanging safety information on a section-wide basis.
4. Reviewing trends in their area.

All groups within the department will be expected to utilize the committee meeting structure. A sample agenda is provided in this document to aid the committees (Figure 1).

**DOCUMENTATION**: Minutes for all committee meetings should be kept and copies should be sent to Safety and Loss Control and the next higher level committee for review and appropriate action.

Figure 1: Sample Agenda

I. Opening Remarks
II. Accident and Injury Status Report
III. Old Business
IV. Subcommittees’ Reports
V. New Business
VI. Safety Awards

**Secretary’s Safety Steering Committee**

This committee will have final approval of all changes in policy. It will be chaired by the Secretary and consist of the Director of Safety and Loss Control, both Deputy Secretaries, the Commissioner of the Division of Motor Vehicles, the State Highway Administrator and the Director of the Governor’s Highway Safety Program. It is recommended that the Secretary’s Safety Committee meet once per quarter or bimonthly as scheduling allows. This committee will send copies of minutes to Safety and Loss Control only.

**State Highway Administrator’s Safety Committee**

The Administrator’s committee will consist of a member of the Administrator’s immediate staff, the Chief Engineers and the Secondary Roads Officer. The committee should meet once per month.
Branch Safety Committee
All Branch Managers will hold committee meetings with their respective unit heads.

B) Subcommittees
To aid the safety committees, a system of subcommittees will be established. These subcommittees will be chaired by committee members and made up of volunteers from the work units. These committees may or may not meet on a regular basis, depending upon need. Subcommittee meetings would occur just prior to full committee meetings. The following is a list of these subcommittees:

1. **Incident and Injury Investigation**
   Review incident investigations, statistics and trends and monitor compliance with recommendations.

2. **Audit Review**
   Review audit reports, compile and analyze data and make periodic safety and housekeeping inspections.

3. **Safety Programs or Special Activities**
   Develop safety programs, safety awards and incentive programs and guide subordinate units’ efforts.

4. **Off-the-Job Safety**
   Plan, develop and promote material for off-the-job safety programs.

5. **Policy and Procedures Review**
   Periodically review policies, procedures, rules and operations to ensure that all necessary safety precautions are being taken.

6. **New Equipment Acceptance**
   Inspect new equipment and facilities to ensure that all safeguards have been provided.

**DOCUMENTATION:** Subcommittees will keep minutes and report to their respective committees.

C) Safety Meetings
Safety meetings are very useful ways of training our employees and they are a vital part of the Department’s safety atmosphere. Safety meetings should be used to present information, discuss problems and new ideas and discuss recent accidents and injuries. These meetings can vary greatly in length but should be held on a regular schedule to keep safety on the employees’ minds. A meeting planner is attached to aid supervisors in planning for and conducting their meetings (See Form M-1).

Safety meetings involve employees in the safety program. They can conduct meetings, report on special projects and lead group discussions. All employees are required to attend safety meetings.

**DOCUMENTATION:** Only monthly meetings will be recorded (See Form M-2). One copy of this form should be forwarded to the lowest safety committee responsible for that unit. Weekly and daily meetings will not be documented; however, a checklist is enclosed for reference (See Form M-3).
Staff Safety Meetings
Staff safety meetings will be conducted by all Department of Transportation supervisors with their direct subordinates. These employees will then hold meetings with their subordinates, continuing the process until every employee within NCDOT has been involved in a safety meeting. This type of layered system will require supervisors to attend a safety meeting and then relay information through subordinates in their respective safety meetings.

D) Auditing
Auditing is an important key to improved safety performance. Auditing identifies unsafe acts and practices before an injury takes place. Audits should be both announced and unannounced.

Commissioner’s Safety Committee
The Commissioner’s committee, chaired by the Commissioner, will include the Deputy Commissioner, a member of the Commissioner’s staff, the Assistant Commissioners, and all Directors. This committee will meet monthly.

Preconstruction Safety Committee
Programs Safety Committee
The Chief Engineer-Preconstruction and the Chief Engineer-Programs will chair their respective committees. Both committees will consist of the appropriate Branch Managers and meet once a quarter or bimonthly as scheduling allows.

When used properly, auditing can:
1. Maintain standards by ensuring that employees follow NCDOT rules and procedures.
2. Identify where rules or procedures are insufficient.
3. Measure the effect of safety education.
4. Reveal weaknesses in the safety program.
5. Motivate employees by showing the results of their safety efforts.
6. Increase safety awareness.

Supervisors will be responsible for auditing. New supervisors will be trained in the methods of auditing by being shown sample conditions and practicing audits (See Form R-1).

DOCUMENTATION: Completed audit forms should be submitted to the next level of management and to the lowest Audit Review Subcommittee responsible for that unit.

Office Environment Audits
Many of the Departments’ employees work in office environments. These areas will not need the frequent audits that the field units will require.

These offices should perform a formal announced audit semi-annually. Intermediate audits would be performed at the discretion of the supervisor.

E) Incident Investigation
An incident is an event that could have, or did, result in personal injury or damage to state or private property. Investigations of these incidents are important for the prevention of future accidents and tracking the quality of our safety program. Incident investigations
will not be a fault-finding process. Once an incident has occurred, it is important to prevent it from happening again.

As soon as possible following a reported incident, the unit supervisor will assemble an incident investigation team. The team will always include the unit supervisor, the immediate supervisor and a peer of the employee(s) involved. Additional management, technical and safety support staff and the involved employee(s) should be included as needed. There should be a rotation for the selection of the peer for the teams.

Inclusion of the employee(s) involved generally improved the response of other employees to the team’s recommendations and can be a valuable resource in discovering vital underlying facts.

The results of the investigation should be communicated to the employees and other supervisors to prevent recurrence of this incident in other groups.

Investigation reports should be reviewed by the Incident and Injury Investigation Subcommittee responsible for that unit. The first line supervisor is responsible for ensuring that the recommendations are implemented. The subcommittees will certify that corrective actions have been taken and documentation is consistent.

**DOCUMENTATION:**
1) Employees will report the incident to the supervisors immediately.
2) Employees will complete the Employee’s Statement Form I-1 and shall return it to their supervisor within one day of the incident. The supervisor shall forward a copy of Form I-1 to Safety and Loss Control within two days of the incident. If a piece of equipment was involved, a Form 140 will also be completed and a copy forwarded to Safety and Loss Control within two days.
3) If an injury has resulted, the immediate supervisor will complete the North Carolina Industrial Commission Form 19 and **send within one day from the date of the knowledge of the injury the original and one copy of Form 19 to NCDOT’s Workers’ Compensation Unit** and one copy to each of the following:
   - The injured employee
   - Safety and Loss Control
   - Division/Unit Safety Officer
   (NC Industrial Commission requires a Form 19 within five days of the date of the knowledge of the injury.)
4) Provide the injured worker the following:
   - Employee Statement Form (Form I-1)
   - NCDOT Medical Authorization/Return to Work Form.
   - NCDOT Work Ability Evaluation Form
   - Leave Option Form (Form FR-26)
   - Copy of the most recent Workers’ Compensation informational brochure
5) As soon as possible following a reported incident, an incident investigation team will review all documentation and complete Parts I, II and IV of the Incident Investigation Summary Form I-2.
6) All documentation (Forms 19, I-1, I-2 and 140, and previous accident history) will be compiled and forwarded to the Incident and Injury Investigation Subcommittee at the time of completion.

7) The Safety Officer and/or Investigating Supervisor will review the incident documentation, determine what corrective actions have been taken and make a report to the Incident and Injury Investigation Subcommittee.

8) The Subcommittee will review all data and complete Part III of the Incident Investigation Form I-2 and forward a copy of Form I-2 to Safety and Loss Control.

9) The Subcommittee will compile trends in their area and make a report at the regularly scheduled full Committee safety meeting. (See section A of this chapter for full Committee safety meeting frequencies.)

NOTE: Forms are included in Chapter 7.
Chapter 3  
Division of Highways - Operations

A) Safety Committees
The safety committees will consist of line organization personnel with Safety and Loss Control acting as a support organization. Each committee will be comprised of top managers in a section and will refer findings up the committee structure. Each committee will be responsible for:

1. Originating, modifying, coordinating and guiding the safety program.
2. Approving the safety policies.
3. Exchanging safety information on a section-wide basis.
4. Reviewing trends in their area.

All groups within the department will be expected to utilize the committee meeting structure. A sample agenda is provided in this document to aid the committees (Figure 1).

**DOCUMENTATION:** Minutes for all committee meetings should be kept and copies should be sent to Safety and Loss Control and the next higher level committee for review and appropriate action.

Monthly committee meetings and monthly safety meetings are documented on Form M-2. Copies of these reports are included in the quarterly Unit Report that is submitted to the Branch Manager.

**Figure 1: Sample Agenda**

I. Opening Remarks  
II. Accident and Injury Status Report  
III. Old Business  
IV. Subcommittees’ Reports  
V. New Business  
VI. Safety Awards

**Operations Safety Committee**
The committee will be chaired by the Chief Engineer-Operations and will include the Chief Engineer’s staff, Branch Managers, Division Engineers, Unit Heads and the Manager of Safety and Loss Control. This committee will meet monthly in conjunction with the Operations staff meeting.

All subcommittee functions will be handled by the Standing Operations Advisory Committee. This committee meets monthly in conjunction with the Operations staff meeting.

**Construction and Materials Branch Safety Committee**
The Branch Manager chairs this committee consisting of the State Construction Engineer, the State Materials Engineer and the State Roadside Environmental Engineer. This committee will meet quarterly.
Maintenance and Equipment Branch Safety Committee
The Branch Manager chairs this committee consisting of the State Road Maintenance Engineer, the State Bridge Maintenance Engineer and the Director of Equipment and Inventory Control. This committee will meet quarterly.

Division Engineer’s Safety Committee
This committee will be chaired by the Division Engineer and will include the Division Construction Engineer, the Division Maintenance Engineer and the Division Operations Engineer. They will meet on a monthly basis and will have the Division Safety Specialist staffed to them. Elements of other statewide operating units may attend the committee meetings as appropriate.

Materials and Tests Safety Committee
The Unit will have its own safety committee chaired by the State Materials Engineer. The Committee’s members will include the Assistant State Materials Engineer, Central Laboratory Heads, Materials Operations Engineer, the Head of Independent Assurance and the Structural Members Engineer. This committee will meet monthly.

Bridge Inspection Safety Committee
This committee will be chaired by the Bridge Inspection Engineer and its members will include the Assistant Bridge Inspection Engineer, the Bridge Inspection Superintendent and each of the Bridge Inspection Supervisors. This committee will meet monthly.

Equipment and Inventory Control Safety Committee
This committee will be chaired by the Director of the Equipment and Inventory Control Unit, and will consist of the Area Equipment Superintendents, the Assistant Director of Equipment and Inventory Control, the Equipment Engineer, the Inventory Control Manager and the Equipment Depot Superintendent. This committee will meet monthly.

In addition to any Department-wide subcommittees, the following subcommittees will also be used:

a) **Equipment Specifications Safety Review**
   This subcommittee, chaired by the Assistant Unit Director, will be comprised of the Area Equipment Superintendents. This group will review equipment specifications for safety.

b) **Industrial Facility Safety**
   This subcommittee will be chaired by the Inventory Control Manager. Its members will include the Equipment Engineer, the Area Equipment Superintendents and the Depot Superintendent. This group will review audits and incident investigations for industrial facility activities.

c) **Office Work Safety, Personal and Driver Safety**
   This subcommittee will be chaired by the Equipment Engineer and will include the Inventory Control Manager and Depot Superintendent. This group will review audits and incident investigations for Equipment and Inventory Control administrative activities. These groups will meet as needed to serve the Safety Committee.
B) Subcommittees
To aid the safety committees, a system of subcommittees will be established. These subcommittees will be chaired by committee members and made up of volunteers from the work units. These subcommittees may or may not meet on a regular basis, depending upon need. Subcommittee meetings would occur just prior to full committee meetings. The following is a list of these subcommittees:

1. **Incident and Injury Investigation**
   - Reviews incident investigations, statistics and trends and monitors compliance with recommendations.

2. **Audit Review**
   - Reviews audit reports, compiles and analyzes data and makes periodic safety and housekeeping inspections.

3. **Safety Programs or Special Activities**
   - Develops safety programs, safety awards and incentive programs and guides subordinate unit’s efforts.

4. **Off-the-Job Safety**
   - Plans, develops and promotes material for off-the-job safety programs.

5. **Policy and Procedures Review**
   - Periodically reviews policies, procedures, rules and operations to ensure that all necessary safety precautions are being taken.

6. **New Equipment Acceptance**
   - Inspects new equipment and facilities to ensure that all safeguards have been provided.

Subcommittees will keep minutes and report to their respective committees.

C) Safety Meetings
Safety meetings are very useful ways of training our employees and they are a vital part of the Department’s safety atmosphere. Safety meetings should be used to present information, discuss problems and new ideas and discuss recent accidents and injuries. These meetings can vary greatly in length but should be held on a regular schedule to keep safety on the employees’ minds. A meeting planner is attached to aid supervisors in planning for and conducting their meetings *(See Form M-1)*.

Safety meetings involve employees in the safety program. They can conduct meetings, report on special projects and lead group discussions. All employees are required to attend safety meetings.

**DOCUMENTATION:** Only monthly meetings will be recorded *(See Form M-2)*. One copy of this form should be forwarded to the lowest safety committee responsible for that unit. Weekly and daily meetings will not be documented; however, a checklist is enclosed for reference *(See Form M-3)*.

**Division Construction Engineer’s Meeting**
**Division Maintenance Engineer’s Meeting**
**Division Operations Engineer’s Meeting**
Each will meet with their direct subordinates on a monthly basis to conduct a formal safety meeting in addition to evaluating accidents and discussing methods of improving safety. It
should be noted that Locations and Surveys Locating Engineers may attend the Division Construction Engineer’s Meeting.

**Resident Engineer’s Meetings**
1) Resident Engineers will hold monthly safety meetings with the Assistant Resident Engineers as well as a monthly meeting with the entire office. The meeting with the Assistant Resident Engineers should be used to discuss ways of improving public and contractor’s safety in work zones as well as to plan the office safety meeting. It is suggested that this meeting take place just prior to the office safety meeting. The office safety meeting will be documented.
2) Assistant Resident Engineers will meet weekly with Project Inspectors and Survey Party Chiefs under their direction to evaluate the safety measures in place and any unsafe conditions. The frequency of the meetings may be varied depending on the type of projects and their complexity. Meetings should be held on the projects.
3) Project Inspectors and Survey Party Chiefs should have daily “tailgate” safety meetings with their subordinates to discuss daily activities with regards to safety.

**District Engineer’s Meetings**
1) District Engineers will hold monthly meetings with all staff reporting directly to them.
2) Highway Maintenance Engineers will hold a monthly meeting for Road Maintenance Supervisors to discuss crew activities, incident investigations and plan the County Maintenance Yard safety meeting. The Highway Maintenance Engineer will also conduct a monthly County Maintenance Yard safety meeting. The County Yard meeting must be documented.
3) Road Maintenance Supervisors will meet weekly with their crew leaders on their projects to evaluate the safety measures in place and any unsafe conditions.
4) Crew Leaders should hold daily “tailgate” safety meetings to discuss the plans for the day and insure that all safety devices needed are on board.

**Division Traffic Engineer’s Meetings**
1) Division Traffic Engineers will hold monthly meetings with all staff reporting directly to them.
2) Traffic Services Supervisors will hold monthly safety meetings for everyone in their shop and weekly meetings with their crew leaders to discuss safety measures and incident investigations. Any personnel unable to attend this meeting will attend a County Maintenance Yard’s monthly safety meeting.
3) Crew Leaders should hold daily “tailgate” safety meetings to discuss the plans for the day and insure that all safety devices are on board.

**Division Roadside Environmental Engineer’s Meetings**
1) The Division Roadside Environmental Engineers will hold a monthly safety meeting with all personnel reporting directly to them. Any personnel unable to attend this meeting will attend a County Maintenance Yard’s monthly safety meeting.
2) Division Roadside Environmental Engineer will hold weekly meetings with the Landscape Specialists to discuss safety measures and accident reports.
3) Landscape Specialists should hold daily “tailgate” safety meetings with their crews to discuss the plans for the day and insure that all safety devices are on board.
**Division Bituminous Engineer’s Meetings**
1) The Division Bituminous Engineers will hold a monthly safety meeting with all personnel reporting directly to them. Any personnel unable to attend this meeting will attend a County Maintenance Yard’s monthly safety meeting.
2) Division Bituminous Engineers will hold weekly meetings with the Crew Leaders to discuss safety measures and accident reports.
3) Crew Leaders should hold daily “tailgate” safety meetings with their crews to discuss the plans for the day and insure that all safety devices are on board.

**Division Equipment Superintendent’s Meetings**
1) Each equipment shop will hold a monthly safety meeting. Personnel will attend the County Maintenance Yard’s meeting in those sub-shops where it would not be appropriate to have an individual meeting.
2) The Equipment Superintendent will hold a monthly meeting with Equipment Supervisors.
3) Mechanic Supervisors and Parts Supervisors will have daily “tailgate” meetings with their personnel.

**Departmental Area Engineers**
Area Engineers will have semi-annual safety meetings with their direct supervisors. They will plan to attend group safety meetings within their assigned Divisions bi-monthly.

**Materials and Tests Central and Regional Laboratories Safety Meetings.**
Each of the four Raleigh laboratories and all regional laboratories will conduct organized safety meetings monthly. They will also hold a short weekly session to discuss any safety items that may have developed.

**Materials Operations Engineer, Independent Assurance and Structural Members Engineer**
The supervisors in these groups will have a monthly safety contact with all employees in their organizations. This contact may be a group meeting or an individual contact by the supervisor.

**Field Operations Engineer, Section Materials Specialist**
The Field Operations Engineer and the Section Materials Specialist will conduct one organized safety meeting per month with employees under their direct supervision.

**Bridge Maintenance Inspection Safety Meetings**
Each group will hold an organized monthly safety meeting to discuss safety concerns and incident investigations.

**Bridge Maintenance Operations Safety Meetings**
1) Bridge Maintenance Superintendents will meet monthly with their Bridge Maintenance Supervisors.
2) Bridge Maintenance Supervisors will meet monthly with their crews.
3) Bridge Maintenance Supervisor or Bridge Worker III’s will hold daily “tailgate” meetings to discuss plans for the day and ensure that all safety devices are on board.
Bridge Maintenance Electrical Engineering Section
The Electrical Engineering Supervisor will have a monthly individual safety contact with his employees.

Equipment and Inventory Control Administrative Safety Meeting
The Director will conduct a monthly safety meeting for all support staff.

Equipment and Inventory Control Supply Warehouse Safety Meeting
The Parts Inventory Supervisor will conduct a monthly safety meeting for the Supply Warehouse staff.

Inventory Support Safety Meeting

Equipment Depot Support Safety Meeting
Monthly meetings will be conducted by the Supervisors for both groups.

Equipment Shop Safety Meetings
Each shop will conduct an individual safety meeting monthly for its employees. Apprentices will attend safety meetings in their assigned shops.

D) Auditing
Auditing is an important key to improved safety performance. Auditing identifies unsafe acts and practices before an injury takes place. Audits should be both announced and unannounced.
When used properly, auditing can:
1) Maintain standards by ensuring that employees follow NCDOT rules and procedures.
2) Identify where rules or procedures are insufficient.
3) Measure the effect of safety education.
4) Reveal weaknesses in the safety program.
5) Motivate employees by showing the results of their safety efforts.
6) Increase safety awareness.

Supervisors will be responsible for auditing. New supervisors will be trained in the methods of auditing by being shown sample conditions and practicing audits (See Form R-1).

DOCUMENTATION: Completed audit forms should be submitted to the next level of management and to the lowest Audit Review Subcommittee responsible for that unit.

Office Environment Audits
Many of the Department’s employees work in office environments. These areas will not need the frequent audits that the field units will require.

These offices should perform a formal announced audit semi-annually. Intermediate audits would be performed at the discretion of the supervisor.

Chief Engineer-Operations
The Chief Engineer-Operations will audit one operation in each division each year. This
audit will be announced to the Division Engineer. Additional audits may be conducted by need not be announced.

**Construction and Materials Branch Manager**
**Maintenance and Equipment Branch Manager**
Branch Managers will audit each unit annually. These audits should be announced.

**Division Engineer**
The Division Engineer will audit each of the following, on a yearly basis. These audits should be both announced and unannounced.

**A) Resident Engineers**
The Division Engineer will audit one active project in each Resident Engineer’s office. These audits will involve reviewing project inspection personnel and survey party crews. The Resident Engineer should accompany the Division Engineer.

**B) District Engineers**
The Division Engineer will audit an operation or a maintenance facility in each district. The District Engineer, the Highway Maintenance Engineer and the Division Maintenance Engineer may accompany the Division Engineer.

**C) Equipment**
The Division Engineer will audit one Equipment Shop each year. The Equipment Superintendent should accompany the Division Engineer.

**D) Division Bituminous Section, Roadside Environmental Section and Traffic Services**
The Division Engineer will audit each of these groups individually. These audits may be of a facility or an operation. The Division Engineer should be accompanied by the manager of each section.

**Division Construction Engineer**
**Division Maintenance Engineer**
**Division Operations Engineer**
These individuals will conduct audits of all the offices reporting to them on a quarterly basis and should be primarily operations reviews.

**Resident Engineer**
The Resident Engineer will audit two active projects each month and each facility quarterly. The frequency of project audits may be varied depending on the types of projects and their complexity.

**Assistant Resident Engineer**
Assistant Resident Engineers will audit two active projects each month. Project reviews will include traffic control, contractor operations and employee activities. The frequency of project audits may be varied depending on the types of projects and their complexity.

**District and Assistant District Engineers**
The District and Assistant District Engineers will jointly audit a force account construction or a maintenance operation every month. They will also audit one maintenance yard each quarter. The Highway Maintenance Engineer may accompany them.
Highway Maintenance Engineer
Highway Maintenance Engineers, along with the respective Road Maintenance Supervisor, will audit crew operations. They will audit two crews per month. Audits of the Maintenance Yard will also be conducted on a quarterly basis.

Division Bituminous Engineer
Roadside Environmental Engineer
Division Traffic Engineer
These individuals, along with their immediate subordinates, will audit at least one facility a quarter with all facilities being audited each year. They will also audit one crew each month.

Equipment Superintendents
Equipment Superintendents will audit one sub-shop per month.

State Materials Engineer
Assistant State Materials Engineer
These individuals will conduct announced audits of the four central labs yearly. They will also conduct eight yearly audits of the other field operations on a random basis.

Materials and Tests Central and Regional Laboratories
The Laboratory Supervisors will audit their laboratories quarterly. It is suggested that Laboratory Supervisors conduct their audits with another Laboratory Supervisor.

Materials Operations Engineer
Independent Assurance
Structural Members Engineer
These individuals will audit each function that reports to them on a quarterly basis. These audits should be performed randomly.

Section Materials Specialist
The Laboratory Supervisors will audit a function that reports to them each month.

Field Operations Engineer
Research and Investigations Engineer will audit the functions that report to their respective departments on a quarterly basis.

State Bridge Maintenance Engineer
Assistant State Bridge Maintenance Engineer
These individuals will audit all bridge maintenance yards yearly.

Bridge Maintenance Superintendent
Bridge Maintenance Superintendents will audit their yards quarterly. Also, in conjunction with the Bridge Maintenance Supervisors, they will audit two crews per month.

Electrical Engineering Supervisor
The Electrical Engineering Supervisor will audit each employee quarterly.
Director of Equipment and Inventory Control and/or Assistant Director of Equipment and Inventory Control
These individuals will audit the Depot Shops with the Depot Superintendents two times per year. They will also audit the warehouse area two times per year. The Inventory Control Manager will accompany them on these audits.

Depot Superintendent
The Depot Superintendent, in conjunction with the Shop Supervisors, will audit each shop quarterly.

Area Equipment Superintendents
The Area Equipment Superintendents will audit one shop in each division quarterly.

E) Incident Investigation
An incident is an event that could have, or did, result in personal injury or damage to state or private property. Investigations of these incidents are important for the prevention of future accidents and tracking the quality of our safety program. Incident investigations will not be a fault-finding process. Once an incident has occurred, it is important to prevent it from happening again.

As soon as possible following a reported incident, the unit supervisor will assemble an incident investigation team. The team will always include the unit supervisor, the immediate supervisor and a peer of the employee(s) involved. Additional management, technical and safety support staff and the involved employee(s) should be included as needed. There should be a rotation for the selection of the peer for the teams.

Inclusion of the employee(s) involved generally improves the response of other employees to the team’s recommendations and can be a valuable resource in discovering vital underlying facts.

The results of the investigation should be communicated to the employees and other supervisors to prevent recurrence of this incident in other groups.

Investigation reports should be reviewed by the Incident and Injury Investigation Subcommittee responsible for that unit. The first line supervisor is responsible for ensuring that the recommendations are implemented. The subcommittees will certify that corrective actions have been taken and documentation is consistent.

DOCUMENTATION:

1) Employees will report the incident to the supervisors immediately.
2) Employees will complete the Employee’s Statement Form I-1 and shall return it to their supervisor within one day of the incident. The supervisor shall forward a copy of Form I-1 to Safety and Loss Control within two days of the incident. If a piece of equipment was involved, a Form 140 will also be completed and a copy forwarded to Safety and Loss Control within two days.
3) If an injury has resulted, the immediate supervisor will complete the North Carolina Industrial Commission Form 19 and **send within one day from the date of the knowledge of the injury the original and one copy of Form 19 to NCDOT’s Workers’ Compensation Unit** and one copy to each of the following:
   ◦ The injured employee
   ◦ Safety and Loss Control
   ◦ Division/Unit Safety Officer
   (NC Industrial Commission requires a Form 19 within five days of the date of the knowledge of the injury.)

4) Provide the injured worker the following:
   ◦ Employee Statement Form (Form I-1)
   ◦ NCDOT Medical Authorization/Return to Work Form
   ◦ NCDOT Work Ability Evaluation Form
   ◦ Leave Option Form (Form FR-26)
   ◦ Copy of the most recent Workers’ Compensation informational brochure

5) As soon as possible following a reported incident, an incident investigation team will review all documentation and complete Parts I, II and IV of the Incident Investigation Summary Form I-2.

6) All documentation (Forms 19, I-1, I-2 and 140, and previous accident history) will be compiled and forwarded to the Incident and Injury Investigation Subcommittee at the time of completion.

7) The Safety Officer and/or Investigating Supervisor will review the incident documentation, determine what corrective actions have been taken and make a report to the Incident and Injury Investigation Subcommittee.

8) The Subcommittee will review all data and complete Part III of the Incident Investigation Form I-2 and forward a copy of Form I-2 to Safety and Loss Control.

9) The Subcommittee will compile trends in their area and make a report at the regularly scheduled full Committee safety meeting. (See Section A of this chapter for full Committee safety meeting frequencies.)

**Note:** **Forms are included in Chapter 7.**
Chapter 4
Division of Highways – Preconstruction (Field Operations)

A) Safety Committees
The safety committees will consist of line organization personnel with Safety and Loss Control acting as a support organization. Each committee will be comprised of top managers in a section and will refer findings up the committee structure. Each committee will be responsible for:

1. Originating, modifying, coordinating and guiding the safety program.
2. Approving safety policies.
3. Exchanging safety information on a section-wide basis.
4. Reviewing trends in their area.

All groups within the department will be expected to utilize the committee meeting structure. A sample agenda is provided in this document to aid the committees (Figure 1).

DOCUMENTATION: Minutes for all committee meetings should be kept and copies should be sent to Safety and Loss Control and the next higher level committee for review and appropriate action.

Monthly committee meetings and monthly safety meetings are documented on Form M-2. Copies of these reports are included in the quarterly Unit Report that is submitted to the Branch Manager.

Figure 1: Sample Agenda

I. Opening Remarks
II. Accident and Injury Status Report
III. Old Business
IV. Subcommittees’ Reports
V. New Business
VI. Safety Awards

Location and Surveys Safety Committee
The State Location and Surveys Engineer will chair the quarterly safety committee. Its members will include Assistant Unit Heads and Area Locating Engineers.

Highway Design Branch Committee
The State Highway Design Engineer will chair the quarterly safety committee. Its members will include the Design Branch Unit Heads, the Branch Staff Engineer and the Administrative Assistant.

Hydraulics Safety Committee
The State Hydraulics Engineer will chair the monthly safety committee. Its members will include the Assistant State Hydraulics Engineer, the Special Studies Manager, the
Maintenance Studies Manager and the Project Managers. The committee will meet for the purpose of presenting information, discussing problems and new ideas, and reviewing incident reports.

**Photogrammetry Safety Committee**  
The State Photogrammetric Engineer will chair his safety committee monthly. Its members will include the Assistant State Photogrammetric Engineer, Photogrammetric Engineering Supervisors, Photo Lab Supervisor, Transportation Staff Engineer and the Administrative Assistant.

**Structure Design Safety Committee**  
The State Bridge Design Engineer will chair a monthly committee whose members will include the Assistant State Bridge Maintenance Engineers, the Administrative Assistant and the Project Engineers.

**Design Services Safety Committee**  
The State Design Services Engineer will chair a quarterly safety committee. Its members will include all managers reporting directly to him as well as the staff engineer.

**Geotechnical Safety Committee**  
The State Transportation Engineering Geologist will chair a quarterly safety committee. Its members will include all Transportation Engineering Geologists Supervisors, the Environmental Engineering Geologists Supervisors, the Environmental Engineering Geologist Supervisor and the Consultant Engineering Geologist Supervisor.

**Roadway Design Safety Committee**  
The Roadway Design Engineer will chair a monthly safety committee. Its members will include all Project Engineers and the Safety Coordinator.

**Right of Way Branch Safety Committee**  
The Right of Way Branch Manager will chair the quarterly safety committee. The committee will meet once a quarter by the 30th day of the third month and the committee members will include the Assistant Branch Managers, Unit Heads, Right of Way Consultant Coordinator and Right of Way Training and Policy Administrator. This meeting, at the discretion of the Branch Manager, may also include all Branch Supervisory Personnel.

**B) Subcommittees**  
To aid the safety committees, a system of subcommittees will be established. These subcommittees will be chaired by committee members and made up of volunteers from the work units. These subcommittees may or may not meet on a regular basis, depending upon need.

Subcommittee meetings would occur just prior to full committee meetings. The following is a list of these subcommittees:

1. **Incident and Injury Investigation**  
2. Reviews incident investigations, statistics and trends and monitors compliance with recommendations.
3) **Audit Review**

Reviews audit reports, compiles and analyzes data and makes periodic safety and housekeeping inspections.

4) **Safety Programs or Special Activities**

Develops safety programs, safety awards and incentive programs and guides subordinate unit’s efforts.

5) **Off-the-Job Safety**

Plans, develops and promotes material for off-the-job safety programs.

6) **Policy and Procedures Review**

Periodically reviews policies, procedures, rules and operations to ensure that all necessary safety precautions are being taken.

7) **New Equipment Acceptance**

Inspects new equipment and facilities to ensure that all safeguards have been provided.

Subcommittees will keep minutes and report to their respective committees.

C) **Safety Meetings**

Safety meetings are very useful ways of training our employees and they are a vital part of the Department’s safety atmosphere. Safety meetings should be used to present information, discuss problems and new ideas and discuss recent accidents and injuries. These meetings can vary greatly in length but should be held on a regular schedule to keep safety on the employees’ minds. A meeting planner is attached to aid supervisors in planning for and conducting their meetings (See Form M-1).

Safety meetings involve employees in the safety program. They can conduct meetings, report on special projects and lead the group discussions. All employees are required to attend safety meetings.

**DOCUMENTATION:** Only monthly meetings will be recorded (See Form M-2). One copy of this form should be forwarded to the lowest safety committee responsible for that unit. Weekly and daily meetings will not be documented; however, a checklist is enclosed for reference (See Form M-3).

**Area Locating Engineer’s Meeting**

The Area Locating Engineers will hold a monthly meeting with their Locating Engineers prior to the group safety meetings. They also will attend the monthly group safety meetings on a rotating basis.

The Area Locating Engineer also will attend Division Safety Committee meetings. They will rotate among the Divisions in their area.

**Locating Engineer’s Meeting**

The Locating Engineers will hold a monthly meeting with all employees reporting to them. The Locating Engineers will attend the Division Construction Engineer’s meeting.

**Assistant Locating Engineer’s Meeting**

The Assistant Locating Engineers will have daily “tailgate” meetings with their crews.
Area Geologist’s Meeting
The Area Geologists will hold monthly safety meetings with their staff.

The Area Geologists will attend the Division Safety Committee meeting and may designate one of their staff members to attend a Resident or District Engineer’s monthly safety meeting.

Highway Geologist II Meeting
The Highway Geologists II or their assistants will hold daily “tailgate” meetings with their crews.

Highway Design Branch Offices
The Highway Design Branch will hold a quarterly office safety meeting. This meeting will include all members of the branch staff.

Hydraulics Engineering Managers
Engineering Managers will conduct monthly safety meetings for all employees in their respective sections. Information presented at the Hydraulics Safety Committee meeting will be discussed along with any other safety concerns.

Hydraulics Field Personnel
Daily “tailgate” meetings will be held for all personnel when performing field operations. These meetings, conducted at the beginning of each workday, will include discussions of hazardous tasks that could be involved in the work along with recommended Safe Operating Procedures.

Photogrammetric Engineering Supervisors
The Photogrammetric Engineering Supervisors will hold a monthly meeting with all employees reporting to them.

Photogrammetric Project Engineers
The Photogrammetric Project Engineers will hold a monthly meeting with all Squad Leaders reporting to them.

Photogrammetry Squad Leaders
Squad Leaders will hold a monthly meeting with their employees.

Photo Lab Supervisor
The Photo Lab Supervisor will hold a monthly meeting with all employees in the lab.

Photogrammetry Administrative Assistant
The Administrative Assistant will hold daily meetings with all employees reporting to them.

Structure Design Project Engineers
Structure Design Project Engineers will meet monthly with their employees.
Design Services Safety Meetings
All managers will hold quarterly safety meetings with the employees reporting directly to them.

These employees will then hold meetings with their subordinates.

Roadway Design Safety Meetings
All Project Engineers will hold monthly safety meetings with all squad members reporting to them.

Right of Way Monthly Safety Meetings
Area Appraiser, Area Relocation Agents, Division Right of Way Agents, Administrative Squads in Central Office and Utility Agents will meet monthly with their respective offices for a group safety meeting.

D) Auditing
Auditing is an important key to improved safety performance. Auditing identifies unsafe acts and practices before an injury takes place. Audits should be both announced and unannounced.

When used properly, auditing can:
1) Maintain standards by ensuring that employees follow NCDOT rules and procedures.
2) Identify where rules or procedures are insufficient.
3) Measure the effect of safety education.
4) Reveal weaknesses in the safety program.
5) Motivate employees by showing the results of their safety efforts.
6) Increase safety awareness.

Supervisors will be responsible for auditing. New supervisors will be trained in the methods of auditing by being shown sample conditions and practicing audits (See Form R-1).

DOCUMENTATION: Completed audit forms should be submitted to the next level of management and to the lowest Audit Review Subcommittee responsible for that unit.

Office Environment Audits
Many of the Department’s employees work in office environments. These areas will not need the frequent audits that the field units will require.

These offices should perform a formal announced audit semi-annually. Intermediate audits would be performed at the discretion of the supervisor.

State Location and Surveys Engineer
Assistant State Location and Surveys Engineer for Statewide Field Operations
Right of Way Unit Heads or Training and Policy Administrator
These individuals will conduct operations audits on each group per year.

Area Locating Engineer
The Area Locating Engineer will audit one group operation each month. They will also audit their facilities twice per year.
Locating Engineer
The Locating Engineer will audit all active projects monthly. They also will audit their facilities monthly.

Assistant Locating Engineer
The Assistant Locating Engineer will audit all active projects monthly.

Geotechnical Audits
1) The Geotechnical Crews will audit their operations daily.
2) Prior to the monthly safety meeting, a committee, made up of at least one member of each crew, will discuss the audits and report findings at the safety meeting

Hydraulics Section
Audits for field operations are conducted twice yearly for each work group in the five sections where applicable. (Field operations in the Special Studies Section are very limited. Audits are to be conducted only when it is deemed there is a sufficient amount of field work performed to warrant an audit.) All audits are to be conducted by Engineering Managers.

Office audits are to be conducted yearly by the Assistant Unit Head. Copies of all audit forms are forwarded to the Design Branch Manager with the quarterly Unit Safety Report.

State Photogrammetric Engineer
Assistant State Photogrammetric Engineer
Transportation Staff Engineer

These individuals will perform operations audits with each group yearly.

Photogrammetric Engineering Supervisors
Photo Lab Manager
Administrative Assistant

These individuals will audit one group operation and their facilities each month.

Photogrammetric Project Engineers

These individuals will audit one group operation and their facilities each month.

Prior to the monthly safety meeting, a committee, made up of one member from each squad, will discuss the audits and report findings at the safety meeting.

E) Incident Investigation
An incident is an event that could have, or did, result in personal injury or damage to state or private property. Investigations of these incidents are important for the prevention of future accidents and tracking the quality of our safety program. Incident investigations will not be a fault-finding process. Once an incident has occurred, it is important to prevent it from happening again.

As soon as possible following a reported incident, the unit supervisor will assemble an
Incident Investigation team. The team will always include the unit supervisor, the immediate supervisor and a peer of the employee(s) involved. Additional management, technical and safety support staff and the involved employee(s) should be included as needed. There should be a rotation for the selection of the peer for the teams.

Inclusion of the employee(s) involved generally improves the response of other employees to the team’s recommendations and can be a valuable resource in discovering vital underlying facts.

The results of the investigation should be communicated to the employees and other supervisors to prevent recurrence of this incident in other groups.

Investigation reports should be reviewed by the Incident and Injury Investigation Subcommittee responsible for that unit. The first line supervisor is responsible for ensuring that the recommendations are implemented. The subcommittees will certify that corrective actions have been taken and documentation is consistent.

**DOCUMENTATION:**

1) Employees will report the incident to the supervisors immediately.

2) Employees will complete the Employee’s Statement Form I-1 and shall return it to their supervisor within one day of the incident. The supervisor shall forward a copy of Form I-1 to Safety and Loss Control within two days of the incident. If a piece of equipment was involved, a Form 140 will also be completed and a copy forwarded to Safety and Loss Control within two days.

3) If an injury has resulted, the immediate supervisor will complete the North Carolina Industrial Commission Form 19 and **send within one day from the date of the knowledge of the injury the original and one copy of Form 19 to NCDOT’s Workers’ Compensation Unit** and one copy to each of the following:
   ◊ The injured employee
   ◊ Safety and Loss Control
   ◊ Division/Unit Safety Officer
   ◊ (NC Industrial Commission requires a Form 19 within five days of the date of the knowledge of the injury.)

4) Provide the injured worker the following:
   ◊ Employee Statement Form (Form I-1)
   ◊ NCDOT Medical Authorization/Return to Work Form
   ◊ NCDOT Work Ability Evaluation Form
   ◊ Leave Option Form (Form FR-26)
   ◊ Copy of the most recent Workers’ Compensation informational brochure

5) As soon as possible following a reported incident, an incident investigation team will review all documentation and complete Parts I, II and IV of the Incident Investigation Summary Form I-2.
6) All documentation (Forms 19, I-1, I-2 and 140, and previous accident history) will be compiled and forwarded to the Incident and Injury Investigation Subcommittee at the time of completion.

7) The Safety Officer and/or Investigating Supervisor will review the incident documentation, determine what corrective actions have been taken and make a report to the Incident and Injury Investigation Subcommittee.

8) The Subcommittee will review all data and complete Part III of the Incident Investigation Form I-2 and forward a copy of Form I-2 to Safety and Loss Control.

9) The Subcommittee will compile trends in their area and make a report at the regularly scheduled full Committee safety meeting. (See Section A of this chapter for full Committee safety meeting frequencies.)

Note: Forms are included in Chapter 7.
Chapter 5
Division of Motor Vehicles

A) Vehicle Registration Section
The Director’s committee, chaired by the Director, will include a member of the Director’s staff, the Administrative Assistant, and the Assistant Directors. These meetings will be held monthly.

Staff safety meetings for all central employees will be held according to the generic program guidelines.

Field personnel will have a monthly safety contact by their supervisor, and a group safety meeting will be held in conjunction with the Field Supervisors’ Meetings.

The Registration Section will follow the audit program described in the generic section of this manual.

International Registration Section
The Director’s committee will include the Assistant Director and the Title Examination Supervisor III. This meeting will be held monthly.

Central IRP personnel will follow the generic program for meetings and audits. Field personnel will have a monthly safety contact from their supervisors.

B) School Bus and Traffic Safety Section
The Director’s safety committee, the Assistant Director and Field Supervisors will meet every two months.

Field Supervisors will meet individually with each employee under their supervision every two months.

The Director, Assistant Director and Trainer will each audit two specialists per year. Supervisors will audit each specialist once per year “behind the wheel” and once per year “in the classroom”.

C) Traffic Records Section
The Director’s committee will consist of permanent and rotating members. The permanent members are Financial Responsibility Supervisor, Data Entry Supervisor II and Microfilm Unit Supervisor, Rotating members are Traffic Data Processing Coordinator, Accident Records Clerical Supervisor, Coding Supervisor, and Pre-evaluation Supervisor. The Director’s committee will meet bimonthly. Rotating Committee members will serve four-month terms.

All Supervisors will follow the generic program schedule for safety meetings.

The Section Director will conduct quarterly audit rotating between groups. All groups will audit in accordance with the generic program. The above-mentioned groups will conduct
monthly facility audits. It is suggested that personnel from other Sections assist in the audits.

D) **Driver License Section**

The Director’s committee will include the Assistant Directors, the Commercial Drivers License coordinator, the Chief Examiners and the Administrative Assistant. This committee will meet monthly.

The Adjudication Division of the Driver License Section will follow the generic program for meetings and audits as presented earlier in the manual.

Each Chief Examiner will meet bi-monthly with their District Supervisors. The District Supervisors will then meet bimonthly with their Senior Examiners. The Senior Examiners will make an individual safety contact with each of their examiners every two months.

Audits of the field units will be conducted as follows. The Director will conduct audits of two field offices per year. The Assistant Director for Certification in conjunction with the Chief Examiners will conduct two field audits per year. The District Supervisors will conduct two audits per year. Senior Examiners will also conduct two audits of their employees per year.

Adjudication will audit in accordance with the procedures described in the generic portion of the program.

E) **Enforcement Section**

The Director’s Safety Committee will include the Assistant Directors, the Administrative Assistant and the Training Officer. This committee will meet every two months.

The Assistant Director for Support Services will make an individual safety contact with each District Supervisor every two months.

The District Supervisors will incorporate a safety meeting into their regular monthly training classes.

The Director, Assistant Director for Support Services and the Training Officer will audit each District every two months. The District Supervisors will audit each office once per year.

Office environments will be audited according to the schedule in the generic program.

F) **Incident Inquiry**

Refer to and follow the procedures listed under Incident Investigation (Paragraph E) in Chapter Two (Generic Program).
Chapter 6
Ferry Division

A) Safety Committees
The safety committees will consist of line organization personnel with Safety and Loss Control acting as a support organization. Each committee will be comprised of top managers in a section and will refer findings up the committee structure. Each committee will be responsible for:

1) Originating, modifying, coordinating and guiding the safety program.
2) Approving safety policies.
3) Exchanging safety information on a section-wide basis.
4) Reviewing trends in their area.

All groups within the department will be expected to utilize the committee meeting structure. A sample agenda is provided in this document to aid the committees (Figure 1).

DOCUMENTATION:
Minutes for all committee meetings should be kept and copies should be sent to Safety and Loss Control and the next higher level committee for review and appropriate action.

Figure 1: Sample Agenda

I. Opening Remarks
II. Accident and Injury Status Report
III. Old Business
IV. Subcommittees’ Reports
V. New Business
VI. Safety Awards

Ferry Director’s Safety Committee
The Director’s committee will consist of the Assistant Directors, all Superintendents and the Administrative Officer. The Marine Engineer will attend at the discretion of the Director. This Committee will meet monthly.

The Director will also hold a Staff Safety Meeting for the personnel in his office.

B) Subcommittees
To aid the safety committees, a system of subcommittees will be established. These subcommittees will be chaired by committee members and made up of volunteers from the work units. These subcommittees may or may not meet on a regular basis, depending upon need.

Subcommittee meetings would occur just prior to full committee meetings. The following is a list of these subcommittees:

1) Incident and Injury Investigation
   Reviews incident investigations, statistics and trends and monitors compliance with recommendations.
2) **Audit Review**  
   Reviews audit reports, compiles and analyzes data and makes periodic safety and housekeeping inspections.

3) **Safety Programs or Special Activities**  
   Develops safety programs, safety awards and incentive programs and guides subordinate unit’s efforts.

4) **Off-the-Job Safety**  
   Plans, develops and promotes material for off-the-job safety programs.

5) **Policy and Procedures Review**  
   Periodically reviews policies, procedures, rules and operations to ensure that all necessary safety precautions are being taken.

6) **New Equipment Acceptance**  
   Inspects new equipment and facilities to ensure that all safeguards have been provided.

Subcommittees will keep minutes and report to their respective committees.

In addition to standard subcommittees, the Ferry Division may find it necessary to utilize a subcommittee to establish trends in passenger accidents on ferries. These accidents should be evaluated for possible corrective actions or preventative measures on the ferry.

**C) Safety Meetings**  
Safety meetings are very useful ways of training our employees and they are a vital part of the Department’s safety atmosphere. Safety meetings should be used to present information, discuss problems and new ideas and discuss recent accidents and injuries. These meetings can vary greatly in length but should be held on a regular schedule to keep safety on the employees’ minds. A meeting planner is attached to aid supervisors in planning for and conducting their meetings *(See Form M-1)*.

Safety meetings involve employees in the safety program. They can conduct meetings, report on special projects and lead group discussions. All employees are required to attend safety meetings.

**DOCUMENTATION:**

Only monthly meetings will be recorded *(See Form M-2)*. One copy of this form should be forwarded to the lowest safety committee responsible for that unit. Weekly and daily meetings will not be documented; however, a checklist is enclosed for reference *(See Form M-3)*.

**Assistant Director for Maintenance and Materials Safety Meeting**  
Safety Meetings will include the Shipyard Superintendent and Field Maintenance Supervisors. These meetings will be held monthly and include both previously prepared topics and current events.

**Maintenance Safety Meetings**  
Supervisors will meet with their units monthly.
Dredge Section Safety Meetings
The Dredge Superintendent will hold monthly safety meetings with the crew of the tug Albemarle, the dredge Carolina’s Captains and the construction crew that supports the dredge. The Captains will meet with their crews during their respective shifts.

Operations Safety Meetings
1) Superintendents will hold monthly meetings with their supervisors. This will take two meetings due to shift work.
2) Supervisors/Port Captains will hold monthly meetings with their Captains and Shore Support Personnel. This will also take two meetings.
3) Captains will hold monthly safety meetings with their crews.

D) Auditing
Auditing is an important key to improved safety performance. Auditing identifies unsafe acts and practices before an injury takes place. Audits should be both announced and unannounced. When used properly, auditing can:
1) Maintain standards by ensuring that employees follow NCDOT rules and procedures.
2) Identify where rules or procedures are insufficient.
3) Measure the effect of safety education.
4) Reveal weaknesses in the safety program.
5) Motivate employees by showing the results of their safety efforts.
6) Increase safety awareness.

Supervisors will be responsible for auditing. New supervisors will be trained in the methods of auditing by being shown sample conditions and practicing audits (See Form R-1).

DOCUMENTATION: Completed audit forms should be submitted to the next level of management and to the lowest Audit Review Subcommittee responsible for that unit.

Maintenance Audits
1) Supervisors will audit their sections weekly.
2) Assistant Director will audit each shop semi-annually.
3) Plant Maintenance Supervisors will conduct an on-site audit weekly. They will also conduct a monthly audit of current field projects as applicable.

Dredge Superintendent Audits
1) The Tug Captain will audit the ship weekly. The Dredge Superintendent will audit the tug monthly.
2) The Dredge Captain will audit the Carolina’s Captains weekly. The Superintendent will audit the Carolina’s Captains monthly.
3) The Dredge Superintendent will audit the construction crews monthly.

Operations Audits
1) Ferries will be audited weekly by the Captains.
2) Supervisors/Port Captains will audit ferries and shore facilities monthly.
3) The Superintendent will audit each Operation Unit once per quarter.
E) Incident Investigation

An incident is an event that could have, or did, result in personal injury or damage to state or private property. **Investigations of these incidents are important for the prevention of future accidents and tracking the quality of our safety program.** Incident investigations will not be a fault-finding process. Once an incident has occurred, it is important to prevent it from happening again.

As soon as possible following a reported incident, the unit supervisor will assemble an incident investigation team. The team will always include the Unit Supervisor, the immediate supervisor and a peer of the employee(s) involved. Additional management, technical and safety support staff and the involved employee(s) should be included as needed. There should be a rotation for the selection of the peer for the teams.

Inclusion of the employee(s) involved generally improves the response of other employees to the team’s recommendations and can be a valuable resource in discovering vital underlying facts.

The results of the investigation should be communicated to the employees and other supervisors to prevent recurrence of this incident in other groups.

Investigation reports should be reviewed by the Incident and Injury Investigation Subcommittee responsible for that unit. The first line supervisor is responsible for ensuring that the recommendations are implemented. The subcommittees will certify that corrective actions have been taken and documentation is consistent.

**DOCUMENTATION:**

1) Employees will report the incident to the supervisors immediately.

2) Employees will complete the Employee’s Statement Form I-1 and shall return it to their supervisor within one day of the incident. The supervisor shall forward a copy of Form I-1 to Safety and Loss Control within two days of the incident. If a piece of equipment was involved, a Form 140 will also be completed and a copy forwarded to Safety and Loss Control within two days.

3) If an injury has resulted, the immediate supervisor will complete the North Carolina Industrial Commission Form 19 and send within one day from the date of the knowledge of the injury the original and one copy of Form 19 to NCDOT’s Workers’ Compensation Unit and one copy to each of the following:
   a. The injured employee
   b. Safety and Loss Control
   c. Division/Unit Safety Officer

   (NC Industrial Commission requires a Form 19 within five days of the date of the knowledge of the injury.)
4) Provide the injured worker the following:
   a. Employee Statement Form (Form I-1)
   b. NCDOT Medical Authorization/Return to Work Form
   c. NCDOT Work Ability Evaluation Form
   d. Leave Option Form (Form FR-26)
   e. Copy of the most recent Workers’ Compensation informational brochure

5) As soon as possible following a reported incident, an incident investigation team will review all documentation and complete Parts I, II and IV of the Incident Investigation Summary Form I-2.

6) All documentation (Forms 19, I-1, I-2 and 140, and previous accident history) will be compiled and forwarded to the Incident and Injury Investigation Subcommittee at the time of completion.

7) The Safety Officer and/or Investigating Supervisor will review the incident documentation, determine what corrective actions have been taken and make a report to the Incident and Injury Investigation Subcommittee.

8) The Subcommittee will review all data and complete Part III of the Incident Investigation Form I-2 and forward a copy of Form I-2 to Safety and Loss Control.

9) The Subcommittee will compile trends in their area and make a report at the regularly scheduled full Committee safety meeting. (See Section A of this chapter for full Committee safety meeting frequencies.)

Note: Forms are included in Chapter 7.
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Supervisor's Worksheet
For Planning A Safety Meeting

Date of Meeting: ______________________ Time: ______________________
Supervisor: ______________________ Unit: ______________________

Meeting Plan

Principle Topic: ______________________
Other Topic: ______________________

Type of Meeting: (example: Open discussion, lecture with discussion, video presentation with discussion, etc.)

Training aids to be used: (Example: Incident Investigation Reports, Safe Operating Procedures, Audit Reports, videotapes, etc.)

Meeting Outline: (List several main points and/or concerns to be discussed by the supervisor)

Sample Form
For online form, see: http://www.doh.dot.state.nc.us/forms/files/FORMM-1.doc

Meeting Procedure

1. Call to order
2. Review: Minutes from previous meetings and discuss previous and/or current Incident Investigation Reports.
3. Discussion: Planned meeting topics. "Yes or No" questions should be avoided to promote discussions from the group.
4. Summary and Conclusion: Summarize the main points of discussion and emphasize how they will improve safety. Conclude the meeting and remind everyone to stay alert and to be safe in their activities.
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Monthly Safety Meeting Report

Department Code: ___________________________  Date: ___________________________
Unit: ______________________________________ District: ______________ Division: __________
Address: ________________________________________________________________
Meeting Chairman: ________________________________________________________
Where feasible attendance should be documented.

Other Persons Present: _______________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Formal Presentation: (Name of presenter and topic): ________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Other Subjects Discussed: _____________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Reports on Weekly Meetings: _________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Employee’s Comments/Suggestions: ____________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

__________________________________________  Chairman’s Signature

CC: Safety Committee

Sample Form

For online form, see: http://www.doh.dot.state.nc.us/forms/files/FORMM-2.doc
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# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

## SAFETY CHECKLIST

Supervisors should use the following as a guide when conducting weekly or daily safety meetings. This list should be modified as needed to work effectively.

<table>
<thead>
<tr>
<th>Operation and work Location:</th>
<th>Traffic Control Required:</th>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Equipment required:</th>
<th>Are all traffic control devices onboard vehicle?</th>
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<tbody>
<tr>
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</tbody>
</table>

Is the equipment right for the job? Are all devices in good condition?

<table>
<thead>
<tr>
<th>Is the equipment performing correctly?</th>
<th>If so, have appropriate safeguards been taken?</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>Is operator aware of equipment limitations?</th>
<th>Have appropriate SOPs been reviewed?</th>
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</table>

<table>
<thead>
<tr>
<th>Personal Protective Equipment needed?</th>
<th>Safety Message:</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>Do all employees have adequate personal protective equipment?</th>
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<td></td>
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</tbody>
</table>

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**Sample Form**

For online form, see: [http://www.doh.dot.state.nc.us/forms/files/FORMM-3.doc](http://www.doh.dot.state.nc.us/forms/files/FORMM-3.doc)
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**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**

**WORKSITE AUDIT**

Date: ________________  Time: ________________  AM/PM  Auditor Name: ________________

Division: ________________  Department: ________________  County: ________________

Worksite Location: ________________

In-Travel Lane? ________________  Posted Speed Limit: ________________

Operation Being Audited: ________________

<table>
<thead>
<tr>
<th>Category</th>
<th>Rating</th>
<th>Observations/Corrective Actions</th>
<th>Abatement Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S</td>
<td>U</td>
<td></td>
</tr>
<tr>
<td><strong>S=Satisfactory, U=Unsatisfactory, N/A=Not Applicable</strong></td>
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<tr>
<td><strong>Safety Equipment</strong></td>
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<tr>
<td>Hard Hat</td>
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<tr>
<td>Vest</td>
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<tr>
<td>Shoes</td>
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<tr>
<td>Hearing Protection</td>
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<td>Eye/Face Protection</td>
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<td>Foot Protection</td>
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<tr>
<td>Gloves</td>
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<tr>
<td>Chain Saw Chaps</td>
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<tr>
<td>Other</td>
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<tr>
<td><strong>Traffic Control</strong></td>
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<td>Signs</td>
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<tr>
<td>Work Zone Length</td>
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<td>Flaggers</td>
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<tr>
<td>Taper</td>
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<tr>
<td>Cones, Drums</td>
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<tr>
<td>Arrow Boards</td>
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<tr>
<td>Attenuator</td>
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<tr>
<td>Sight Distance</td>
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<tr>
<td>Other</td>
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<tr>
<td><strong>Worksite</strong></td>
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<tr>
<td>Utilities Located/Guarded</td>
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<tr>
<td>Excavation</td>
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<tr>
<td>Confined Space</td>
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<tr>
<td>Housekeeping</td>
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<tr>
<td>Lockout/Tagout</td>
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<tr>
<td>Fire Protection</td>
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<tr>
<td>Hazardous Materials</td>
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<tr>
<td>Electrical Hazards (GFCI)</td>
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<tr>
<td>Other</td>
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</table>

Sample Form

For online form, see: [http://www.doh.dot.state.nc.us/forms/files/FORMR-1.doc](http://www.doh.dot.state.nc.us/forms/files/FORMR-1.doc)
### Rating Observations/Corrective Actions

**Abatement Date**

<table>
<thead>
<tr>
<th>Category</th>
<th>Rating</th>
<th>Observations/Corrective Actions</th>
<th>Abatement Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S</strong></td>
<td><strong>U</strong></td>
<td><strong>N/A</strong></td>
<td><strong>S=Satisfactory, U=Unsatisfactory, N/A=Not Applicable</strong></td>
</tr>
</tbody>
</table>

#### Tools
- In Safe Condition
- Used Correctly
- Right for Job
- Other

#### Equipment
- Back-up Alarms
- Spotter for Backing
- Strobes/Warning Lights
- Seat Belt Use
- Pinch Points

#### Other
- Elevated Work
- Ladders

#### Lifelines
- Harness/Lanyards
- Scaffolds
- Other

#### People
- Positioning
- Lifting Techniques
- Respiratory Hazards
- Skin Irritants
- Other

#### Tailgate Safety Meeting

**General Comments:**

---

CC: Supervisor’s Supervisor

Audit Review Subcommittee

**Sample Form**

For online form, see: [http://www.doh.dot.state.nc.us/forms/files/FORMR-1.doc](http://www.doh.dot.state.nc.us/forms/files/FORMR-1.doc)
<table>
<thead>
<tr>
<th>S</th>
<th>U</th>
<th>N/A</th>
<th>S</th>
<th>U</th>
<th>N/A</th>
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</thead>
<tbody>
<tr>
<td>1. First Aid</td>
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<tr>
<td>a. Certified first aid assistance available</td>
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<tr>
<td>b. Emergency numbers posted</td>
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<tr>
<td>2. Fire Protection</td>
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<tr>
<td>a. Emergency plan understood/posted</td>
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<tr>
<td>b. Extinguisher charged/conspicuous location</td>
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<tr>
<td>c. Access to fire equipment</td>
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<tr>
<td>d. Lights/doors/signs</td>
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<tr>
<td>e. Employee trained in use of extinguishers</td>
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<tr>
<td>3. Security</td>
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<tr>
<td>a. Doors/windows, etc. secured when required</td>
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<td>b. Department shutdown security</td>
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<td>c. Equipment secured</td>
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<td>d. Unauthorized entry policy adhered to</td>
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<td>e. Other</td>
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<td>4. Machinery</td>
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<td>a. Operating machines attended</td>
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<td>b. Emergency stops operational</td>
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<td>c. Platforms/ladders/catwalks</td>
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<td>d. Instructions to operate/stop posted</td>
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<td>e. Maintenance performed</td>
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<td>f. Guards in place</td>
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<td>g. Area free of pinch points</td>
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<td>h. Lock-out policy posted/adhered to</td>
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<td>i. Other</td>
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<td>5. Material Storage</td>
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<tr>
<td>a. Hazardous &amp; flammable materials identified</td>
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<tr>
<td>b. Hazardous &amp; flammable materials storage</td>
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<tr>
<td>c. Stacking/loading security</td>
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<td>d. Lighting, warning signs, ventilation</td>
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<td>e. Other</td>
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<td>6. Policy Procedures</td>
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<td>a. Specific details of work assignment given</td>
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<td>b. Oriented/trained for job</td>
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<td>c. Informed and aware of</td>
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<td>d. Demonstrate job skills</td>
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<td>e. Use of safety equipment</td>
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<td>f. Other</td>
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<td>7. Miscellaneous</td>
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<td>d.</td>
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<td>8. Illumination-Wiring</td>
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<td>a. Necessary and used properly</td>
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<td>b. Lights on during shutdown</td>
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<td>c. Wire Condition</td>
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<td>d. Circuits Loading</td>
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<tr>
<td>e. Machinery grounded</td>
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<td>f. Proper wiring in hazardous location (wash house)</td>
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<td>g. Wall outlets/extension cords</td>
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<td>b. Adequate lighting</td>
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<tr>
<td>i. Glare/eye strain</td>
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<td>j. Other</td>
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<td>9. General Area</td>
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<tr>
<td>a. Floor condition</td>
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<td>b. Special purpose flooring</td>
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<td>c. Aisle, clearance/markings</td>
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<td>d. Lighting, warning signs, ventilation</td>
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<td>e. Other</td>
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<td>10. Housekeeping</td>
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<tr>
<td>a. Cleanliness of vehicle</td>
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<td>b. Machined</td>
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<td>c. Waste disposal</td>
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<tr>
<td>d. Vending machines/food</td>
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<tr>
<td>e. Rodent, insect, vermin control</td>
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<td>f. Other</td>
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<td>11. Vehicles</td>
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<tr>
<td>a. Cleanliness of vehicle</td>
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<td>b. Unauthorized use</td>
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<tr>
<td>c. Operating unauthorized vehicle</td>
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<td>d. Vehicle operation</td>
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<td>e. Obeying traffic rules</td>
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<td>f. Seat belt use</td>
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<td>g. Certified in defensive driving</td>
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<td>12. Tools</td>
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<tr>
<td>a. Power tool wiring</td>
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<tr>
<td>b. Condition of hand tools</td>
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<tr>
<td>c. Safe storage</td>
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<td>d. Other</td>
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</tbody>
</table>
NCDOT EMPLOYEE INCIDENT REPORT

Instructions: Employee must complete report. If more room is needed, continue in a Word document and attach it to this submission.

Employees are required to complete this form for all incidents and near hits. This form should be completed in its entirety and should be an accurate and truthful Account of the accident/incident. Providing false and/or misleading information may result in disciplinary action up to and including dismissal and/or additional criminal and/or civil liability. This form should be completed by the employee only.

Supervisor Review: If an employee is unable to complete this form, the Supervisor must list reason(s) for assisting or completing this report.

My signature below certifies that the information I have provided is true and accurate. I further understand that this information may be used to determine whether the claim will be paid or denied and that I should not complete this form unless there are exceptional circumstances present preventing the employee from completing this form. Check Not applicable (employee completed form) or sign below if you assisted with the completion of this form.

<table>
<thead>
<tr>
<th>Employee Information</th>
<th>Date/Location Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name (Full):</td>
<td>Date of Incident:</td>
</tr>
<tr>
<td>Job Title:</td>
<td>Time of Day:</td>
</tr>
<tr>
<td>Employee Telephone #:</td>
<td>Date Reported to Supervisor:</td>
</tr>
<tr>
<td>Division/County:</td>
<td>Time of Day:</td>
</tr>
<tr>
<td>Department:</td>
<td>Incident Location (address, Building name, office, cross streets, fire name, woods, facility, room #, etc.):</td>
</tr>
<tr>
<td>Dated Hired:</td>
<td>Work Address:</td>
</tr>
<tr>
<td>Supervisor:</td>
<td></td>
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<tr>
<td>Supervisor Phone #:</td>
<td></td>
</tr>
</tbody>
</table>

Witness Information

Were there any witnesses to the incident? ☐ Yes ☐ No Number of Witnesses (if applicable): ______________

If yes, list all known witnesses/phone #’s below, please include additional names on attachment if needed.

<table>
<thead>
<tr>
<th>Name:</th>
<th>Phone #:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td>Phone #:</td>
</tr>
</tbody>
</table>

Medical Information

Part(s) of the body injured:

Prior to this accident/incident, have you ever been hurt, suffered injury, or received treatment for the body part(s) listed above? Yes ☐ No ☐

If yes, please provide the date of prior injury, type of injury, names of treating physician or practice group.

Description of Accident/Incident (If this is a Backing Accident, state whether a Spotter was available in vehicle or close by that could have assisted.)

What was the root cause of the incident? Ask why, and then ask why again. (e.g. Why? I slipped on scrap metal. Why? The work area was not cleaned up. Why? I was rushing to get project done and did not take time to clean up the work area.)

Suggested Corrective Actions

I hereby certify that the information I have provided is true and accurate. Any inaccurate or false statements may result in a delay in process of this claim. I further understand that this information may be used to determine whether the claim will be paid or denied.

<table>
<thead>
<tr>
<th>Employee Name:</th>
<th>Signature:</th>
<th>Date:</th>
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</table>

December 2017

Chapter 7 – Forms I-1
<table>
<thead>
<tr>
<th>Ferry Equipment</th>
<th>Wiring &amp; Lighting</th>
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</thead>
<tbody>
<tr>
<td>a. Life saving equipment</td>
<td>a. Wire condition</td>
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<tr>
<td>b. Inflatable life raft</td>
<td>b. Circuit loading</td>
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<tr>
<td>c. Navigation lights</td>
<td>c. Lighting adequate</td>
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<tr>
<td>d. Horn, bell &amp; compass</td>
<td>d. Other</td>
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<tr>
<td>e. Radios, loran &amp; radars</td>
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<tr>
<td>f. Anchor gear</td>
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<tr>
<td>g. Fuel shut-off valves &amp; reach rods</td>
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<tr>
<td>h. Steering gear &amp; emergency steering</td>
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<tr>
<td>i. Bilge pumping system</td>
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<tr>
<td>j. Water-tight hatches, gaskets &amp; knife</td>
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<tr>
<td>k. Other</td>
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<tr>
<td>2 First aid</td>
<td>9 General Area</td>
</tr>
<tr>
<td>a. Stretchers and kits</td>
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<tr>
<td>b. Certifies first aid assistance available</td>
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<tr>
<td>3 Fire Protection</td>
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<tr>
<td>a. Emergency plan/Fire drill preparation</td>
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<tr>
<td>b. Extinguisher checked/conspicuous</td>
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<tr>
<td>c. Fire pumps &amp; hoses</td>
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<tr>
<td>d. Employees sufficiently</td>
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<tr>
<td>e. Other</td>
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<td>4 Security</td>
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<tr>
<td>a. Doors/windows, etc. secured</td>
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<tr>
<td>b. Equipment secured</td>
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<tr>
<td>d. Unauthorized entry policy adhered to</td>
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<tr>
<td>e. Other</td>
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<tr>
<td>5 Machinery</td>
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<tr>
<td>a. Operating machines attended</td>
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<tr>
<td>b. Emergency stops operational</td>
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<tr>
<td>c. Platforms/ladders/catwalks</td>
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<tr>
<td>d. Maintenance performed</td>
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<tr>
<td>e. Guards in place</td>
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<td>f. Tagout policy adhered to</td>
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<td>g. Piping</td>
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<tr>
<td>h. Ventilation</td>
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<tr>
<td>i. Other</td>
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<tr>
<td>6 Material storage</td>
<td>12 Personal Protection Devices</td>
</tr>
<tr>
<td>a. Hazardous &amp; flammable materials identified</td>
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<tr>
<td>b. Hazardous &amp; flammable materials storage</td>
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<tr>
<td>c. Other</td>
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</tbody>
</table>

Sample Form
For online form, see: [http://www.doh.dot.state.nc.us/forms/files/FORMR-3.doc](http://www.doh.dot.state.nc.us/forms/files/FORMR-3.doc)
## Discrepancies

<table>
<thead>
<tr>
<th>No.</th>
<th>Corrective Action Needed</th>
<th>Abatement Date</th>
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### General Comments

Sample Form

For online form, see: [http://www.doh.dot.state.nc.us/forms/files/FORMR-3.doc](http://www.doh.dot.state.nc.us/forms/files/FORMR-3.doc)

Audited by: 

Copy to: Supervisor’s Supervisor, Audit Review Subcommittee
NCDOT EMPLOYEE INCIDENT REPORT

Instructions: Employee must complete report. If more room is needed, continue in a Word document and attach it to this submission.

Employees are required to complete this form for all incidents and near hits. This form should be completed in its entirety and should be an accurate and truthful Account of the accident/incident. Providing false and/or misleading information may result in disciplinary action up to and including dismissal and/or additional criminal and/or civil liability. This form should be completed by the employee only.

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My signature below certifies that the information I have provided is true and accurate. I further understand that this information may be used to determine whether the claim will be paid or denied and that I should not complete this form unless there are exceptional circumstances present preventing the employee from completing this form. Check Not applicable (employee completed form) or sign below if you assisted with the completion of this form.

Supervisor Name: __________________________ Signature: __________________________

Employee Information

<table>
<thead>
<tr>
<th>Name (Full):</th>
<th>Date of Incident:</th>
<th>Time of Day:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee Personnel/Beacon #:</td>
<td>Date Reported to Supervisor:</td>
<td>Time of Day:</td>
</tr>
<tr>
<td>Job Title:</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Employee Telephone #:</td>
<td>Work Address:</td>
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</tr>
<tr>
<td>Division/County:</td>
<td>Incident Location (address, Building name, office, cross streets, fire name, woods, facility, room #, etc.):</td>
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<tr>
<td>Department:</td>
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<td>Dated Hired:</td>
<td>Time in Current Job:</td>
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<tr>
<td>Supervisor:</td>
<td>Supervisor Phone #:</td>
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<tr>
<td>County:</td>
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</tbody>
</table>

Date/Location Information

Witness Information

Were there any witnesses to the incident? ☐ Yes ☐ No Number of Witnesses (if applicable): ____________
If yes, list all known witnesses/phone #’s below, please include additional names on attachment if needed.
Name: Phone #:
Name: Phone #:

Medical Information

Part(s) of the body injured:
Prior to this accident/incident, have you ever been hurt, suffered injury, or received treatment for the body part(s) listed above? Yes ☐ No ☐
If yes, please provide the date of prior injury, type of injury, names of treating physician or practice group.

Description of Accident/Incident (If this is a Backing Accident, state whether a Spotter was available in vehicle or close by that could have assisted.)

What was the root cause of the incident? Ask why, and then ask why again. (e.g. Why? I slipped on scrap metal. Why? The work area was not cleaned up. Why? I was rushing to get project done and did not take time to clean up the work area.)

Suggested Corrective Actions

I hereby certify that the information I have provided is true and accurate. Any inaccurate or false statements may result in a delay in process of this claim. I further understand that this information may be used to determine whether the claim will be paid or denied.

Employee Name: __________________________ Signature: __________________________ Date: __________________________

December 2017

Chapter 7 – Forms I-1
### NCDOT SUPERVISOR INCIDENT INVESTIGATION REPORT

| Instructions: Begin investigation within 24 hours and attach the Employee Incident Report and Witness Reports to this report. Forward all reports ASAP. |
| Division/Unit: | Date of Incident: |
| Department: | County: |
| Employee Name: | Employee Personnel #: | Employee Beacon #: | Employee Phone #: |
| Supervisor Name: | Supervisor Personnel #: | Supervisor Beacon #: | Supervisor Phone #: |

### Investigation Team Members:
- **Incident Classifications (check all that apply)**
  - [ ] Equipment Damage
  - [ ] Near Hit
  - [ ] Injury
  - [ ] Fatality
  - [ ] Property Damage
  - [ ] Spill
  - [ ] Possible Blood Borne Pathogen exposure

- **Employee required:**
  - [ ] First-Aid Only
  - [ ] Medical treatment and released
  - [ ] Hospitalized
  - [ ] Did not return to work (Lost Days)

- **Employee:**
  - [ ] Returned to work no restrictions
  - [ ] Returned to work with restrictions
  - [ ] Other:

- **Hazard Types (select one based on origination of injury in this preference order):**
  - [ ] Violence or injuries caused by people or animals
  - [ ] Transportation
  - [ ] Fires or Explosions
  - [ ] Slips, Trips, Falls Surface Level
  - [ ] Fall from Elevation
  - [ ] Exposure to harmful substances or environment
  - [ ] Contact with objects or equipment (Struck By, Struck Against, Caught-on, Caught between, Puncture, Cut)
  - [ ] Over-Exertion (lifting)
  - [ ] Bodily Motion (reaching, twisting, running)
  - [ ] Other (List Here):

### Names of Witnesses Interviewed:

### Incident Information

Describe the specific activity the employee was engaged in and the sequence of events. Include objects or substances that directly injured or made the employee ill. Describe tools, equipment, and PPE in use. Describe property damage. Attach pictures or police reports. Describe the estimated damage to any vehicles or equipment (make, model, ID number, etc.)

### Is the activity part of the employee’s normal job? **Yes**

Prior to beginning activity, did the employee review potential hazards/dangers? **Yes**

Date employee last received SOP Review / /

### Post-Crash Testing is required following any crash for employee in which an employee is involved while operating a motor vehicle or equipment on the job in which (1) a life is lost, or (2) driver is cited for moving traffic violation and individuals were either transported for medical treatment or vehicle is disabled and removed from the scene by other than its own power. Did any of the above conditions result from the accident? **Yes**, was Post-Accident Testing conducted? **Yes**

### What was the root cause of the incident? Ask why then ask why again (e.g. Why? The employee slipped on scrap metal. Why? The work area was not cleaned up. Why? The employee was rushing to get a project done and did not take time to clean up the work area.)

### Action taken or will be taken to prevent reoccurrence (If corrective action will occur in the future, provide estimated completion date.)

I hereby certify that the information I have provided is true and accurate. Any inaccurate or false statements may result in a delay in process of this claim. I further understand that this information may be used to determine whether the claim will be paid or denied. I also acknowledge that I understand that in addition to being disciplined for providing false and/or misleading information up to and including dismissal, I may also be subjected to additional criminal and/or civil liability.

**Supervisor’s Name:**

**Signature**

**Date of Report: / /**

The Supervisor will forward the signed copies of the Employee Incident Report I-1, Supervisor’s Incident Investigation Report I-2, and Witness Statements I-3, to the Incident & Injury Investigation Subcommittee. The Incident & Injury Subcommittee will review and ensure acceptable Corrective Action has been identified and implemented The WCA will receive all reports and all supporting documentation.

**I&I Subcommittee Members:**

**Date Corrective Actions Completed:**

**December 2017**
### ACCIDENT BREAKDOWN BY CHARACTERISTIC
(check all that apply)

<table>
<thead>
<tr>
<th>Nature of Injury</th>
<th>Part of Body Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amputation or Enucleation</td>
<td>No Physical Injury</td>
</tr>
<tr>
<td>Assault</td>
<td>Head</td>
</tr>
<tr>
<td>Burn or Scald</td>
<td>Neck</td>
</tr>
<tr>
<td>Contusion, Bruise</td>
<td>Eyes (Including Vision)</td>
</tr>
<tr>
<td>Electric Shock</td>
<td>Arm(s) (Above Wrist)</td>
</tr>
<tr>
<td>Eye, Foreign body in</td>
<td>Hand(s) (Including Wrist)</td>
</tr>
<tr>
<td>Fracture, Broken Bone</td>
<td>Finger(s) and Thumb(s)</td>
</tr>
<tr>
<td>Freezing, Frostbite</td>
<td>Upper Extremity, Multiple Parts (shoulder, arm, forearm, wrist, or hand)</td>
</tr>
<tr>
<td>Hearing Loss or Impairment</td>
<td>Abdomen (Including Internal Organs)</td>
</tr>
<tr>
<td>Heat Exhaustion, Sunstroke</td>
<td>Back (Including Muscles, Spine)</td>
</tr>
<tr>
<td>Hernia or Rupture</td>
<td>Chest (Including Internal Organs)</td>
</tr>
<tr>
<td>Infection</td>
<td>Hips (Including Pelvic Organs)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Accidents</th>
<th>Safety Equipment in Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bodily Reactions (Sprains, Strains, Rupture, Etc.)</td>
<td>Respirator</td>
</tr>
<tr>
<td>Caught In, Under, Or Between</td>
<td>Lanyards &amp; Lifelines</td>
</tr>
<tr>
<td>Contact With Temperature Extremes (Fire, Cold)</td>
<td>Fluorescent Vests</td>
</tr>
<tr>
<td>Disease Exposure</td>
<td>Buoyant Work Vest</td>
</tr>
<tr>
<td>Electrical Shock</td>
<td>Warning &amp; Control</td>
</tr>
<tr>
<td>Falls (All Types)</td>
<td>Seat Belts</td>
</tr>
<tr>
<td>Noise Exposure</td>
<td>Shoulder Harness</td>
</tr>
<tr>
<td>Repetitive Motion</td>
<td>Safety Equipment, National Electrical Code (NEC)</td>
</tr>
</tbody>
</table>

### EQUIPMENT ACCIDENT BY CHARACTERISTIC
(check all that apply)

<table>
<thead>
<tr>
<th>Roadway Condition</th>
<th>Weather</th>
<th>Type of Equipment Accident</th>
<th>Causes for Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry</td>
<td>Clear</td>
<td>Turning</td>
<td>Operating at Unsafe Speed</td>
</tr>
<tr>
<td>Wet</td>
<td>Cloudy</td>
<td>Backing</td>
<td>Improper Backing</td>
</tr>
<tr>
<td>Snow/Ice</td>
<td>Fog</td>
<td>Rear-End Collision</td>
<td>Failure to Obey Traffic Laws</td>
</tr>
<tr>
<td>Mud</td>
<td>Misting</td>
<td>Struck by Another Vehicle</td>
<td>Ingesting or Mixing Controlled Substance to Create Hazard</td>
</tr>
<tr>
<td>Other</td>
<td>Rain</td>
<td>Object Dropped on Vehicle</td>
<td>Unsafe Equipment</td>
</tr>
<tr>
<td></td>
<td>Snow/Sleet/Ice</td>
<td>Hit Stationary Object</td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td>Smoke/Dust</td>
<td>Ran Off Road</td>
<td>No Unsafe Acts Observed</td>
</tr>
</tbody>
</table>

When submitting this report, include pictures of incident location, equipment in use, the vehicle used (if applicable), and any third party reports (i.e. Police Report, OSHA Report, etc.).
NCDOT WITNESS STATEMENT FORM

Instructions: Before providing the required information below, please note that you will have to certify the truthfulness of this information. You will also be required to acknowledge that you understand that in addition to being disciplined for providing false and/or misleading information, up to and including dismissal, you may also be subjected to additional criminal and/or civil liability. To help you write this statement, please include, if possible, the following information:

Type of Investigation:
☐ Safety Incident  ☐ Injury Review  ☐ Accident Review  ☐ Near Hit  ☐ Property Damage

Witness Information

Name:
☐ Employee  ☐ Contractor  ☐ Private Citizen
Employee Personnel #:

Work Address:

Work Phone #:

Incident Information

Date of Incident:

Time of Incident:

Location of Incident:

Do you have any pictures of the incident?  ☐ Yes  ☐ No
If yes, please attach them to this submission.

List the names of anyone present who observed or may have knowledge of the incident.

State what you know about the incident. Indicate who, what, where, and when. Be as specific as possible. If you need more space than what is provided here, create a Word document and attach it to this submission.

I hereby certify that the information I have provided is true and accurate. I acknowledge that any inaccurate or false statements may result in a delay in process of this claim. I further understand that this information may be used to determine whether the claim will be paid or denied.

Witness Name:  Witness Title:

Signature:  Date of Statement:

August 2016
**North Carolina Industrial Commission**

**EMPLOYER’S REPORT OF EMPLOYEE’S INJURY OR OCCUPATIONAL DISEASE TO THE INDUSTRIAL COMMISSION**

To the Employer:

A copy of this Form 19 accompanied by a blank Form 18 must be given to the employee. It does not satisfy the employee's obligation to file a claim. The filing of this report is required by law. This form MUST be transmitted to the Industrial Commission through your Insurance Carrier.

Cost Center #: ___________________ Date of Hire #: ___________________

The filing of this report is required by law. It will be provided by return letter and is to be referenced in all future correspondence.

The use of this form is required under the provisions of the Workers’ Compensation Act.

<table>
<thead>
<tr>
<th>Employee’s Name (NO initials)</th>
<th>Employer’s Name</th>
<th>Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address (NO PO Box)</td>
<td>Employer’s Address</td>
<td>CorVel Corporation</td>
</tr>
<tr>
<td>City</td>
<td>State</td>
<td>Zip</td>
</tr>
<tr>
<td>PO Box 98057</td>
<td>Raleigh</td>
<td>27624</td>
</tr>
<tr>
<td>Social Security Number</td>
<td>Carrier’s Address</td>
<td>City</td>
</tr>
<tr>
<td>Home Telephone</td>
<td>Work Telephone</td>
<td>Carrier’s Telephone Number</td>
</tr>
<tr>
<td>Work Telephone</td>
<td>City</td>
<td>Zip</td>
</tr>
<tr>
<td>Social Security Number</td>
<td>Sex</td>
<td>Date of Birth</td>
</tr>
<tr>
<td>Social Security Number</td>
<td>Date of Birth</td>
<td></td>
</tr>
<tr>
<td>Social Security Number</td>
<td>Fax Number</td>
<td></td>
</tr>
</tbody>
</table>

**Employer**

1. Give nature of employer’s business

2. Location of plant where injury occurred
   - County
   - Village

3. Date of injury / / 4. Day of week / / Hour of day: [ ] A.M. [ ] P.M.

5. Was employee paid for entire day / / 6. Date disability began / /
   - [ ] A.M. [ ] P.M.

7. Date you or the supervisor first knew of injury / / 8. Name of supervisor

**Person Injured**

9. (a) Occupation when injured (b) Employment: Full Time, Part Time, Temp, Other...
   - (c) No. of days worked per week
   - (d) Avg. weekly wages w/ overtime

10. (a) Time employed by you (b) Wages per hour $

11. (a) No. hours worked per day (b) Wages per day $ (c) No. of days worked per week

12. Describe fully how injury occurred and what employee was doing when injured:

   (Statement made without prejudice and without vouching for correctness of information)

13. List all injuries and specify body part involved (e.g. right hand or left hand):

14. Date & hour returned to work / / at : [ ] A.M. [ ] P.M.

15. If so, at what wages $ per

16. At what occupation

17. Employee’s salary continued in full?

18. Was employee treated by a physician

19. Has injured employee died

20. If so, give date of death (Submit Form 29)

**OSHA 301 Information:**

<table>
<thead>
<tr>
<th>Case Number from Log</th>
<th>Date Hired: / /</th>
<th>Time Employee began work on date of incident: [ ] A.M. [ ] P.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of facility:</td>
<td>Address: Street/City/Zip/Telephone</td>
<td>ER visit? [ ] Yes [ ] No Overnight stay? [ ] Yes [ ] No</td>
</tr>
</tbody>
</table>

**Attention:** This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.
IMPORTANT INFORMATION FOR EMPLOYER

Employer must furnish a copy of this form, as completed, to the employee or the employee’s representative when submitted to the Insurance Carrier or Claims Administrator for transmission to the Commission. Every question must be answered. This Form 19 must be transmitted to the Commission through your insurance carrier/claims administrator, and is required by law to be filed within 5 days after knowledge of accident. Employer must also give employee a blank Form 18.

IMPORTANT INFORMATION FOR EMPLOYEE

Reporting an Injury

If you do not agree with the description or time of the accident given on this form, you should make a written report of injury to the employer within thirty (30) days of the injury.

Making A Claim

To be sure you have filed a claim, complete a Form 18, Notice of Accident, within two years of the date of the injury and send a copy to the Industrial Commission and to your employer. The employer is required by law to file this Form 19, but the filing of the Form 19 does not satisfy the employee’s obligation to file a claim. The employee must file a Form 18 even though the employer may be paying compensation without an agreement, or the Commission may have opened a file on this claim. A claim may also be made by a letter describing the date and nature of the injury or occupational disease. This letter must be signed and sent to the Industrial Commission and to your employer.

FOR ASSISTANCE OR TO OBTAIN A FORM 18 FROM THE INDUSTRIAL COMMISSION, YOU MAY CALL (800) 688-8349

USE YOUR I.C. FILE NUMBER (IF KNOWN) OR SOCIAL SECURITY NUMBER ON ALL FUTURE CORRESPONDENCE WITH THE COMMISSION

[SPANISH TRANSLATION]

INFORMACIÓN IMPORTANTE PARA LOS EMPLEADOS

Reporte de una Lesión (Reporting an Injury)

Si usted no está de acuerdo con la descripción o la hora del accidente que aparece en el formulario, debe hacer un reporte de la lesión por escrito y dárselo a su empleador dentro de un período de treinta (30) días a partir de la fecha de la lesión.

Cómo Presentar una Reclamación (Making a Claim)

Para ceriorirse de que ha presentado una reclamación, complete el Formulario 18 Notificación de Accidente dentro de un período de dos años a partir de la fecha de la lesión y envíe una copia a la Comisión Industrial y una copia a su empleador. Por ley, el empleador debe presentar el Formulario 19, sin embargo, el presentar el Formulario 19 no cumple con la obligación que tiene el empleado de presentar una reclamación. El empleado debe presentar el Formulario 18 aunque el empleador esté pagando compensación sin tener un acuerdo o si la Comisión ha creado un expediente con respecto a esta reclamación. También se puede presentar una reclamación por medio de una carta explicando la fecha y la naturaleza de la lesión o la enfermedad ocupacional. Esta carta se debe firmar y enviar a la Comisión Industrial así como al empleador.

PARA RECIBIR ASISTENCIA O PARA OBTENER EL FORMULARIO 18 DE LA COMISIÓN INDUSTRIAL, USTED PUEDE HABLAR AL (800) 688-8349

EN TODA LA CORRESPONDENCIA QUE ENVÍE A LA COMISIÓN INDUSTRIAL POR FAVOR ESCRIBA EL NÚMERO DE CASO DESIGNADO POR LA COMISIÓN [I.C. FILE NUMBER] (SI LO SABE) O SU NÚMERO DE SEGURO SOCIAL.
**Accident**

<table>
<thead>
<tr>
<th>List of all divisions, units or sections involved</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Location of accident</td>
<td></td>
</tr>
<tr>
<td>(County)</td>
<td>(Hwy. No.)</td>
</tr>
<tr>
<td>(East, West, No., So.)</td>
<td>Date</td>
</tr>
<tr>
<td>(Day of Week)</td>
<td>(Speed Limit)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Veh. No. 1: Name</th>
<th>Beacon #</th>
<th>Dept. Code</th>
<th>Co. No.</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driver Lic. No.</td>
<td>Class (A, B, C)</td>
<td>Driving Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td>Temporary Service (Yrs.)</td>
<td>Permanent Service (Yrs.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dates of previous accidents while driving state equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Veh. No. 2: Name</th>
<th>Beacon #</th>
<th>Dept. Code</th>
<th>Co. No.</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driver Lic. No.</td>
<td>Class (A, B, C)</td>
<td>Driving Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td>Temporary Service (Yrs.)</td>
<td>Permanent Service (Yrs.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dates of previous accidents while driving state equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**State Operators/ Employees**

<table>
<thead>
<tr>
<th>State Veh. No. 1: Equip No.</th>
<th>Lic. No.</th>
<th>Make &amp; Type</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equip. Damage: (describe fully)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Est. Cost of Repair</td>
<td>Who made estimate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed at time of accident (mph)</td>
<td>Injuries (describe fully, include names)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>State Veh. No. 2: Equip No.</th>
<th>Lic. No.</th>
<th>Make &amp; Type</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equip. Damage: (describe fully)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Est. Cost of Repair</td>
<td>Who made estimate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed at time of accident (mph)</td>
<td>Injuries (describe fully, include names)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**State Equipment/ Injuries**

**Private Parties and their Equipment**

<table>
<thead>
<tr>
<th>Veh. No.</th>
<th>Name</th>
<th>Address</th>
<th>Home Phone</th>
<th>Business Phone</th>
<th>Age</th>
<th>Driver Lic. No.</th>
<th>Veh. Make/Type/Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veh. Lic. No.</td>
<td>State</td>
<td>Speed at time of accident (mph)</td>
<td>No. of other occupants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liability insurance company (name, address &amp; policy number)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Owners name and address (if different from driver)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Est. damage to veh.</td>
<td>Describe injuries to all occupants (identify by name and age)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Property Damage**

<table>
<thead>
<tr>
<th>Property Damage</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated value of property before accident</td>
<td>Estimated cost to repair or replace</td>
</tr>
<tr>
<td>(Note: Complete items 4 and 5 on persons involved in property damage)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description and cause of accident</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I have investigated this accident and answered all questions fully and accurately

<table>
<thead>
<tr>
<th>Supervisor’s Name Typed Here</th>
<th>Supervisor’s Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dept. Name and Address</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FILL IN THE FOLLOWING SPACE SHOWING DIRECTION & POSITIONS OF AUTOMOBILES INVOLVED, DESIGNATING CLEARLY POINT OF CONTACT.

INSTRUCTIONS
(1) USE SOLID LINE TO SHOW PATH OF VEHICLE BEFORE ACCIDENT

_____________________________ 1

DOTTED LINE AFTER ACCIDENT

_____________________________ 2

(2) NUMBER EACH VEHICLE & SHOW DIRECTION OF TRAVEL

Witnesses and remarks (provide witnesses names & addresses)

Travelers Insurance Company notified (if applicable): Date: ________ How ________________ Time ________ AM/PM

Traffic citations (X if applicable): Driver of Veh. No. 1  Driver of Veh. No. 2  Driver of Veh. No. ________

Violations charged  __________________________ Name and address of investigating officer  __________________________

For incidents where no traffic citation issued, were there other contributing factors for equipment damage: (X if applicable):

NCDOT Employee at Fault  NCDOT Employee Not at Fault  Other (List Below)  

Describe Other:

When did claimant advise operator of alleged accident? At scene  Other Location  

Distance from scene  ________ Was operator aware his equipment caused the damage?  

Was load or mower inspected by supervisor following the accident?  ________ If so, when?  

Truck:  Was truck properly loaded to avoid spillage?  

Was object reported to have thrown by wheel?  

Was there evidence of stone or dirt on body or chassis rails?  

Mower:  Condition of area being mowed – Rocky  Rough & Uneven  High Grass  Normal  Intersection  

Other  ________ Were safety shields in place?  ________ At what height was mower set to cut?  

Was mower traveling with flow of traffic?  Against flow of traffic?  

Distance of mower from claimant’s vehicle  ________ Comments  

Thrown Objects by Trucks/Mowers

1

2
Chapter 8 - Introduction to Procedures

These procedures have been developed to assist managers and employees in carrying out the work activities and operations of the Department in a safe manner. Potential hazards have been identified for typical activities and work sites in each unit, and Safe Operating Procedures written to avoid these hazards. Similar procedures have also been provided for all vehicles, equipment, tools and accessories.

The Safe Operating Procedures have been divided into three sections: General Safe Operating Procedures, Chapter 10; Work Site and Work Activity Safe Operating Procedures, Chapter 11; and Equipment Safe Operating Procedures, Chapter 12. These are preceded by a departmental index, Chapter 9, that lists the procedures applicable in each department. Each crew leader/supervisor will be furnished a safety manual and are expected to keep it with them at all times.

These procedures should not be utilized as substitutes for employee job training. Rather they should serve as a review for performing the tasks safely. These reviews will be conducted during safety meetings.

All procedures are intended to comply with state, local and federal laws. All laws should be strictly adhered to in case of conflict.

The utilization of the Safe Operating Procedures contained in this manual as related to law enforcement personnel are not intended to be all-inclusive or to usurp any standard law enforcement practices. Governing procedures and policies administered by the North Carolina Justice Standards Division are primary governing policies for law enforcement personnel.

Employees are responsible for working in a safe manner. They will also comply with all applicable Safe Operating Procedures in addition to any other safety laws, rules, policies, or procedures.

Employees must wear the required personal protective equipment specified for each operation. Employees are encouraged to report all safety and health problems without fear of retaliation.

Crew Leaders/Supervisors should review appropriate Safe Operating Procedures before beginning new activities, and should review Safe Operating Procedures for routine operations every ten working days.

Crew Leaders/Supervisors are responsible for providing each employee with the appropriate personal protective equipment, and training to perform their assigned tasks.

Crew Leaders/Supervisors are responsible for their employees observing and obeying all applicable Safe Operating Procedures, rules, policies, and laws necessary for their safety and take disciplinary action as needed to obtain compliance.
This page was intentionally left blank.
### CHAPTER 9 - DEPARTMENTAL LISTINGS

**Facilities Management**

#### Chapter 10 SOPs – General

<table>
<thead>
<tr>
<th>All SOPs</th>
<th>Revision #</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-1 through 10-23</td>
<td></td>
</tr>
</tbody>
</table>

#### Chapter 11 SOPs – Work Sites and Work Activities

**A. Shop/Yard**

- Glass Cutting 11A-8 1
- Loading/Unloading Freight 11A-13 1
- Plumbing Operations 11A-29 1
- Service Station Operation 11A-32 1
- Wood Working 11A-41 1

**B. Field - DOH**

- Demolition of Structure 11B-18 1
- Masonry, Activities 11B-51 1
- Placing Concrete 11B-60 1
- Structural Steel Fabrication 11B-77 1

**E. Special Activities**

- Confined Space Entry 11E-1 2
- Excavating, Trenching and Shoring 11E-3 2
- Hazardous Waste Handling and Storage 11E-5 1
- Jump Starting 11E-7 1
- Lockout/Tagout 11E-8 1
- Rigging 11E-9 1

#### Chapter 12 SOPs – Equipment

**A. Self Propelled**

- Forklift 12A-6 2
- Tractor, Backhoe and Loader 12A-22 2
- Truck, Crew Cab and Flatbed 12A-29 1

**B. Tools and Accessories**

- Air Compressor 12B-1 2
- Chain Saw and All-Purpose Cut-Off Saw 12B-4 2
- Concrete Mixer 12B-6 1
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- Concrete Saw 12B-8 2
- Generator 12B-12 1
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<td>Work Boat</td>
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## B. Tools and Accessories

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Author: Paul Roberts
Revision #: 2
Date Issued: August 2018
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### Chapter 11 SOPs – Work Sites and Work Activities

#### A. Shop/Yard

- Service Station Operation 11A-32 1
- Trichloroethane Still 11A-37 1

#### B. Field – DOH

- Asphalt Field Laboratory 11B-2 1
- Blast Monitoring 11B-7 2
- Construction Elevations on Bridge Beams 11B-16 1
- Density Inspection 11B-19 1
- Drilled Shaft Inspection 11B-24 1
- Field Surveying 11B-35 1
- Geographic Hazards 11B-36 1
- Inspection of New Structures 11B-46 1
- Nuclear Density Inspection 11B-54 1
- Pile Driving 11B-57 1
- Roadway Inspection 11B-69 1
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#### D. Emergency Activities

- Field Emergency Response 11D-1 3

#### E. Special Activities

- Confined Space Entry 11E-1 2
- Construction Safety Emphasis Areas 11E-2 1
- Excavating, Trenching and Shoring 11E-3 2
- Hazardous Waste Handling and Storage 11E-5 1
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#### B. Tools and Accessories

- Hand Tools (Power and Manual) 12B-13 1
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## Chapter 11 SOPs – Work Sites and Work Activities

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- Abrasive and Waterblast Cleaning 11A-1 1
- Electrical Installation/Repairs 11A-4 1
- Equipment/Automotive Painting 11A-5 1
- Equipment Body Repair 11A-6 1
- Glass Cutting 11A-8 1
- Hoisting/Jacking 11A-9 1
- Hose Crimp Machine 11A-10 1
- Hydraulic System Repairs 11A-11 1
- Maintenance and Repair Shops (General) 11A-21 1
- Mechanic Operations 11A-22 1
- Metal Cleaning, Chemical/High Pressure Wash 11A-23 1
- Metal Cleaning, Mechanical/Abrasive 11A-24 1
- Metal Punching, Forming and Shearing 11A-25 1
- Metal Removing by Machine 11A-26 1
- Sandblasting 11A-31 1
- Service Station Operation 11A-32 1
- Tire Repair 11A-35 1
- Welding, Arc 11A-39 1
- Welding, Oxy-Acetylene Cutting/ 11A-40 1

### B. Field - DOH
- Roadside Equipment Repair 11B-68 1
- Towing Disabled Equipment 11B-81 1

### D. Emergency Activities
- Field Emergency Response 11D-1 3

### E. Special Activities
- Confined Space Entry 11E-1 2
- Hazardous Waste Handling and Storage 11E-5 1
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| Traffic Survey Equipment/Maintenance | 11B-83 | 1 |
| Tree Felling | 11B-84 | 2 |

**D. Emergency Activities**

| Field Emergency Response | 11D-1 | 2 |

**E. Special Activities**

| Confined Space Entry | 11E-1 | 2 |
| Excavating, Trenching and Shoring | 11E-3 | 2 |
| Explosives | 11E-4 | 2 |
| Hazardous Waste Handling and Storage | 11E-5 | 1 |
| High Pressure Hoses | 11E-6 | 1 |
| Jump Starting | 11E-7 | 1 |
| Lockout/Tagout | 11E-8 | 1 |
| Rigging | 11E-9 | 1 |

**Chapter 12 SOPs – Equipment**

**A. Self Propelled**

| Asphalt Distributor/Kettle | 12A-1 | 1 |
| Broom | 12A-3 | 1 |
| Crane/Dragline | 12A-4 | 1 |
| Excavator, Hydraulic | 12A-5 | 2 |
| Forklift | 12A-6 | 2 |
| Grader | 12A-7 | 1 |
| Lawn Mower | 12A-9 | 1 |
| Loader, Force Feed | 12A-10 | 2 |
| Loader, Front End | 12A-11 | 1 |
| Pavement Grinder | 12A-13 | 1 |
| Paving Machine/Widener | 12A-14 | 1 |
| Post Driver | 12A-15 | 1 |
| Rollers, Patch | 12A-16 | 1 |
| Rollers, Sheep Foot/Rubber-Tired/Vibratory | 12A-17 | 1 |
| Rotary Slope Mower | 12A-18 | 1 |
| Scraper | 12A-19 | 1 |
| Spreader, Aggregate | 12A-21 | 1 |
| Tractor, Backhoe and Loader | 12A-22 | 2 |
| Tractor, Crawler | 12A-23 | 1 |
| Tractor Mower | 12A-24 | 1 |
| Tractor, Wheel | 12A-25 | 1 |
| Truck, Aerial Device | 12A-26 | 2 |
| Truck, Asphalt Patcher | 12A-27 | 1 |
| Truck, Crew Cab and Flatbed | 12A-29 | 1 |
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**New**
## Chapter 10 SOPs – General

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## Chapter 11 SOPs – Work Sites and Work Activities

### A. Shop/Yard
- Hoisting/Jacking 11A-9 1
- Lifting/Fleeting Vessels 11A-12 1
- Maintenance and Repair Shops (General) 11A-21 1
- Warehouse 11A-38 1

### B. Field - DOH
- Inmate Labor 11B-44 1

### C. Field – DMV
- Behind the Wheel Training of School Bus Drivers 11C-1 1
- Commercial Vehicles Examination and Road Test 11C-2 1
- Investigations 11C-3 1
- Non-Commercial Vehicles Examination and Road Test 11C-4 1
- Training for Firearms 11C-5 1

### D. Emergency Activities
- Field Emergency Response 11D-1 3

### E. Special Activities
- Confined Space Entry 11E-1 2
- Hazardous Waste Handling and Storage 11E-5 1
- Jump Starting 11E-7 1
- Lockout/Tagout 11E-8 1

## Chapter 12 SOPs – Equipment

### A. Self Propelled
- Truck, Tractor and Trailer 12A-36 1

### B. Tools and Accessories
- Hand Tools (Power and Manual) 12B-13 1
- Ladder 12B-15 1
# Chapter 10 SOPs – General

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# Chapter 11 SOPs – Work Sites and Work Activities

## A. Shop/Yard
- **Service Station Operation**  
  11A-32  
  1

## B. Field - DOH
- **Bituminous Surface Treatment**  
  11B-6  
  1

## D. Emergency Activities
- **Field Emergency Response**  
  11D-1  
  3

## E. Special Activities
- **Hazardous Waste Handling and Storage**  
  11E-5  
  1
- **High Pressure Hoses**  
  11E-6  
  1
- **Jump Starting**  
  11E-7  
  1

# Chapter 12 SOPs – Equipment

## A. Self Propelled
- **Asphalt Distributor/Kettle**  
  12A-1  
  1
- **Broom**  
  12A-3  
  1
- **Lawn Mower**  
  12A-9  
  1
- **Rollers, Patch**  
  12A-16  
  1
- **Rollers, Sheep Foot/Rubber-Tired/Vibratory**  
  12A-17  
  1
- **Spreader, Aggregate**  
  12A-21  
  1
- **Tractor, Wheel**  
  12A-25  
  1
- **Truck, Crew Cab and Flatbed**  
  12A-29  
  1
- **Truck, Dump**  
  12A-30  
  2

## B. Tools and Accessories
- **Attenuator, Truck Mounted**  
  12B-2  
  1
- **Hand Tools (Power and Manual)**  
  12B-13  
  1
- **Tractor Attachments**  
  12B-29  
  1
- **Trailers and Towed Equipment**  
  12B-30  
  1
# Division Roadside Environmental

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## Chapter 11 SOPs – Work Sites and Work Activities

### A. Shop/Yard
- Loading/Unloading Freight 11A-13 1
- Plumbing Operations 11A-29 1
- Service Station Operation 11A-32 1
- Warehouse 11A-38 1

### B. Field - DOH
- Hand Removal of Vegetation 11B-42 1
- Herbicide and other Spraying Operations 11B-43 1
- Planting and Plant Bed Maintenance 11B-61 1
- Rest Area Maintenance 11B-66 1
- Seeding, Mulching and Topdressing 11B-72 1
- Towing Disabled Equipment 11B-81 1
- Tree Felling 11B-84 2

### D. Emergency Activities
- Field Emergency Response 11D-1 3

### E. Special Activities
- Confined Space Entry 11E-1 2
- Hazardous Waste Handling and Storage 11E-5 1
- High Pressure Hoses 11E-6 1
- Jump Starting 11E-7 1
- Lockout/Tagout 11E-8 1
- Rigging 11E-9 1

## Chapter 12 SOPs – Equipment

### A. Self Propelled
- Bark Spreader 12A-2 1
- Forklift 12A-6 2
- Hydro Seeder 12A-8 1
- Lawn Mower 12A-9 1
- Tractor, Backhoe and Loader 12A-22 2
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#### B. Tools and Accessories

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## Chapter 11 SOPs – Work Sites and Work Activities

### A. Shop/Yard
- Metal Punching, Forming and Shearing 11A-25 1
- Service Station Operation 11A-32 1
- Traffic Services’ Shops and Warehouse 11A-36 1
- Warehouse 11A-38 1

### B. Field - DOH
- Installation of Paint Lines 11B-47 1
- Overhead and Cantilever Sign Maintenance 11B-55 1
- Pavement Marking Removal 11B-56 1
- Raised Pavement Marker Installation/Maintenance 11B-65 1
- Roadway Lighting Installation/Maintenance 11B-70 1
- Sign Installation/Maintenance 11B-73 1
- Special Markings Installation 11B-74 1
- Traffic Signal Installation/Maintenance 11B-82 1
- Traffic Survey Equipment/Maintenance 11B-83 1
- Tree Felling 11B-84 2

### D. Emergency Activities
- Field Emergency Response 11D-1 3

### E. Special Activities
- Confined Space Entry 11E-1 2
- Excavating, Trenching and Shoring 11E-3 2
- Hazardous Waste Handling and Storage 11E-5 1
- High Pressure Hoses 11E-6 1
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## Equipment and Inventory Control

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Author: Paul Roberts
Revision #: 2
Date Issued: August 2018
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## Chapter 11 SOPs – Work Sites and Work Activities

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# Chapter 11 SOPs – Work Sites and Work Activities

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SAFE OPERATING PROCEDURES

Accident and Injury Response

1. Take appropriate action to prevent additional injuries and/or accidents.
2. Attend to injured person(s) in accordance with first aid training. The safe working practice for First Aid is an excellent review on how to handle a situation involving personal injury. (Ref. SOP 10-8)
3. When an injured employee requires medical treatment, the immediate supervisor is responsible for ensuring that prompt medical treatment is provided. The welfare of the injured employee is primary; do not economize; use an ambulance if necessary. A supervisor will accompany the injured employee to the medical facility.
4. For motor vehicle accidents, call the Police and the EMS and fire department when needed.
5. Be courteous, answer police questions, and give identifying information to other parties involved. Do not assume responsibility.
6. Complete the information in the Motor Vehicle Accident Reporting Kit provided by the Travelers Company.
7. Employees are required to report minor incidents to their supervisor as soon as possible, or at least before the end of the work shift and before going to a doctor.
8. Serious incidents shall be reported immediately. If there is a fatality, an immediate report to the Raleigh Office is also required.
9. If a serious injury or fatality occurs, the highest level supervisor available should meet with family members to explain the circumstances and to provide assistance.

Related SOP’s

General SOP’s.................................Chapter 10
SAFE OPERATING PROCEDURES

Cold Weather Safety

1) Whenever possible, schedule coldest part of work for the warmest part of the day.
2) Reorganize work procedures to minimize sitting still or standing for long periods of time.
3) All employees who have not been working in the cold environment must adjust to the cold before expecting to be fully productive (5-7 days).
4) Be sure to drink plenty of warm, sweet, caffeine-free, non-alcoholic drinks or soup.
5) Take regular rest breaks in a warm place, if possible.
6) Wear the proper clothing in layers. Wool, polypropylene or 50/50 cotton and polyester blend should be worn next to the skin. Outer garments should be of waterproof, wind resistant material like nylon.
   A good example of layering would be a wool shirt or sweater over a cotton one and then an outer nylon jacket.
7) Employees should be sure to wear a hat or other head covering as up to 40% of heat loss occurs when the head is exposed.
8) Wear waterproof boots with two pairs of socks. The inner pair should be cotton and the outer pair wool.
9) Employees should wear gloves for light to moderate work anytime the air temperature falls below 40 degrees F.
10) Keep as dry as possible and have extra clothing readily available to change into if you do get wet.
11) Remember! The frequency of accidents is higher in cold weather. Make allowances for your slowed reflexes and numbed hands when doing your job.
12) Be aware of ice on sidewalks, pavement and in shaded areas around buildings. Avoid areas where accumulated ice may cause a slip and/or fall.

Related SOP’s

General SOP’s....................................Chapter 10
Office Ergonomics

Hazard Review

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1. Office Ergonomics is all about setting-up your office work space to fit you so you can work in a comfortable neutral posture. Reference workspace guide photo below.
2. Adjust your chair for an upright posture with feet flat on floor or on footrest if working surface height requires adjusting chair where feet are not flat on floor. Front of seat should not be pressing against back of legs which can restrict circulation to feet.
3. Since office chairs will vary, learn how to use chair adjustments to provide you with adequate lower back support. Adjust chair armrests so your arms gently rest on them with your shoulders relaxed.
4. Chair armrests should not be used to support your arms while using keyboard or mouse since this restricts circulation in arms and puts strain on shoulders.
5. It is recommended that you get up out of your chair once an hour even if just to stretch to allow good circulation in your legs and reduce any back fatigue.
6. Forearms, writs, and hands should be in straight line when using the keyboard and mouse for neutral posture. If keyboard tray is being used, adjust it to the proper height to provide neutral posture.
7. Gel wrist rests should be used to avoid contact stress on hard work surface when using keyboard and mouse and provide a more neutral posture.
8. Avoid using excessive force typing on keyboard or gripping mouse.
9. Position your monitor at least and arm’s length directly in front of you to keep head in a straight neutral posture to reduce eye strain.
10. Monitor height should allow line of sight to be eye level with top row of icons on screen or slightly below. For bifocal users, monitor viewing height may need to be adjusted lower.
11. Repetitive motion should not be a problem if you intermittently change tasks or take short micro-breaks to pause for a few seconds.
12. Avoid excessive brightness or glare from overhead lighting which may result in eye strain.
13. If you cannot set-up your workspace to fit you, you may need an ergonomic assessment. Have your supervisor request an ergonomic assessment from your safety support staff.

![Workspace Set Up Guide](image-url)
SAFE OPERATING PROCEDURES

Domestic and Wild Animals

Field employees are at risk from exposure to all types of animals, their waste products and their carcasses. Rodents and other animals can harbor disease-causing agents very harmful to humans. Care should be taken to avoid all wild animals and domestic animals that have the potential to harm you.

To avoid accident or injuries associated with rodents and other animals observe the following guidelines:

1) Be aware of your surroundings and note any wild or suspicious acting animals in your work area. If necessary, seek safe shelter from these animals.
2) Avoid reaching or stepping into or over hidden areas that may contain such animals.
3) When working with soil, be aware of signs that indicate above or below ground animal nests and take appropriate action to prevent contamination by dust or injury from bites.
4) Spray animal carcasses with a disinfectant (Lysol) prior to removal and wear rubber gloves to remove animal carcasses. Dispose of dead animals in compliance with applicable county health guidelines. Wash exposed skin with an antibacterial or disinfectant soap (i.e., Dial or Dermascrub) after removal and disposal of the animal.
5) If an animal bite occurs, clear the wound with soap and water, and follow appropriate first aid procedures. Immediately report the incident to your supervisor.
6) Transport any bite victim to the NCDOT preferred provider located in your Division/area. (If possible, safely capture or kill the animal so it can be tested for any known disease-causing agents.)
7) If exposure to airborne particles and dust from a nest does occur, immediately report the incident to your supervisor. (If possible, and without exposing yourself, mark the site without disturbing it so trained personnel can collect samples to determine if any disease-causing agents are present.)
8) Avoid direct contact with bird, bat and other animal droppings. Areas where birds and bats roost should be avoided or appropriate respiratory protection shall be used.

Related SOP’s
General SOP’s.................................Chapter 10
SAFE OPERATING PROCEDURES

Equipment Mounting and Dismounting SOP 10-5

1) Park in an area that provides maximum protection for operator and passengers and which provides a solid landing during mounting and dismounting.
2) Do not leave equipment unattended with engine running. Shut off engine and set parking brake when equipment is not in use.
3) When mounting or dismounting equipment, use all steps and all handholds provided.
4) **DO NOT JUMP FROM EQUIPMENT.**
5) Use a three-point method in mounting and dismounting equipment. When mounting, face the equipment and using both hands, firmly grasp handholds while placing one foot solidly on step. When dismounting, face the equipment and place both feet solidly on steps and use one hand to firmly grasp handhold.

**Related SOP’s**

General SOP’s...............................Chapter 10
SAFE OPERATING PROCEDURES

Exposure to Blood or Bodily Fluids (Bloodborne Pathogens) SOP 10-6

1) Always treat blood and bodily fluids as if they are infected with transmittable diseases.
2) Report any accident/incident involving the transfer of blood or bodily fluids to the supervisor immediately.
3) Personal Protective Equipment (PPE) will be provided and used by all employees considered to be at risk of infection.
4) Gloves are to be worn for touching blood and bodily fluids, mucous membranes or non-intact skin of all persons, for handling items or surfaces soiled with blood or bodily fluids, and for rendering assistance to injured persons.
5) Always wash hands and arms after helping a victim. If washing facilities are not available, transport the exposed individual to a facility where soap and water are available.
6) For employees trained in CPR, separate yourself from direct contact with the victim by using a face shield or mask, or one-way resuscitating device.
7) Any items located that are believed to be human waste products (i.e., blood, soiled clothing, needles, or items identified with the universal biohazard symbol) should be handled only with personal protective equipment.
8) All items known to be contaminated with blood or bodily fluids should be disposed of in a plastic bag, along with gloves and other protective equipment used in the disposal process. This bag should then be labeled as to its contents and a Safety Officer notified for disposal procedures.
9) All equipment and working surfaces shall be decontaminated with an appropriate disinfectant to eliminate the potential for infection.
10) NCDOT will provide a free hepatitis B vaccination for employees considered at the greatest risk of infection.
11) A copy of the exposure control plan is available by request for all employees to review, (Bloodborne Pathogens SPP #1910.1030.)

Biohazard Symbol
This is a universal symbol identifying material or objects contaminated with human blood or bodily fluids.

Related SOP’s
General SOP’s………………………….Chapter 10
SAFE OPERATING PROCEDURES

Fire Safety

**Buildings**

1. All employees should know escape routes and locations of fire exits.
2. All fire exits must be unobstructed, unlocked and marked.
3. Fire/smoke alarms should be tested and fire drills conducted regularly.
4. All employees should know the location of and how to use fire extinguishers.
5. Facilities should be periodically inspected to ensure fire extinguishers are charged and to identify and eliminate fire hazards. Fire extinguisher locations should be properly marked.
6. Wiring and/or extension cords used for office machines or other appliances should be checked periodically.

**Job Sites**

1. When refueling vehicles, turn off engines. No smoking or open flames are permitted in the area.
2. Use extra caution when working with flammable materials on job site. Refer to MSDS.
3. Use only approved marked safety containers for storing and transporting flammable materials.
4. After refueling portable tools/equipment with gasoline engines, move at least 25 feet from refueling site to start engine.
5. Operator should know the location of and how to use the fire extinguishers. Fire extinguishers should be inspected to ensure that they are charged.
6. Allow space for fuel expansion in fuel tanks and containers.

**Related SOP’s**

General SOP’s ......................... Chapter 10
SAFE OPERATING PROCEDURES

First Aid

First Aid SOP 10-8

If an injury occurs, the first aider should:

1) Evaluate the accident area to ensure he does not become involved in the same accident situation. The injured person should not be moved unless a life threatening condition exists.
2) Remain calm and take charge of the situation until professional medical help arrives.
3) Direct others briefly and clearly as to how they can help or secure help.
4) Conduct a primary survey of the victim to detect life-threatening conditions that require immediate attention. These include:
   A. Respiratory Arrest
      • Ensure adequate breathing by establishing and maintaining an open airway.
      • If there are no signs of breathing, give artificial breathing (mouth-to-mouth using by-pass resuscitator is preferred method).
      • If victim experiences circulatory failure, start CPR if trained to perform it.
   B. Severe Bleeding
      • Determine if from capillaries, veins or arteries.
      • If artery or vein is involved, use the following methods in this order:
        • Apply direct pressure using a sterile bandage or the cleanest material available.
        • Elevate the bleeding part of the body above the head if no fractures are involved and injury will not be aggravated.
        • Apply pressure at closest available pressure point.
        • Apply a tourniquet only as a last resort and only if bleeding cannot be controlled any other way.
   C. Shock
      • Be prepared to treat for shock even when there is little or no injury. First aid procedures are:
        • Keep victim lying down.
        • Provide as much fresh air as possible.
        • Loosen tight clothing at the neck, waist and chest.
        • Keep the victim warm and dry by wrapping in blankets or similar materials.
        • Do not give victim anything by mouth.
        • Help victim maintain a good positive attitude by remaining calm, using reassuring tones and keeping onlookers away.

5) Determine if transportation is necessary. Transportation of the injured person will depend on the judgment call of the first aider. In many cases, particularly with fractures, back and similar injuries, it is wiser to call the rescue squad or Emergency Medical Services for professional help. They have backboards, inflatable splints and other equipment that can be used to move the victim without causing additional injuries.
6) Only after the life threatening injuries and medical help has been requested, should the first aider proceed to the following steps. Most of these additional steps may not be necessary if medical help can get to the site.

7) Dress any open wounds with bandage compresses, cravat bandages or any other clean materials that are available. It is only necessary for this material to last until the victim can be moved to professional medical help.

8) Splint any fractures with the best available material. Shovel handles, sticks, rolled up newspaper, etc., can be used as improvised splints.

9) When all else fails, the first aider should use his best judgement and do whatever is necessary to save the life.

Definition
First aid is the immediate care given to a person who is injured or ill.

Principal Aims are:
- Care for life threatening conditions.
- Protection from further injury or complications.
- Arranging transportation for the victim to a medical facility.
- Making the victim as comfortable as possible while waiting for assistance.

Training Policy
- OSHA regulations require that someone in each crew be trained in first aid procedures when medical assistance is not reasonably accessible in terms of time and distance. NC DOT policy is to train all employees in first aid with refresher courses every three years.

Related SOP’s
General SOP’s.................................Chapter 10
SAFE OPERATING PROCEDURES

Flagging Traffic

1. Flaggers shall be properly trained in flagging techniques prior to beginning a flagging operation.
2. Site supervisors shall discuss and document flagging operations as part of tailgate/ORM meeting.
3. Flaggers shall wear appropriate PPE including safety footwear, safety glasses, High-Visibility ANSI 107-2004 or equivalent revision Class 2 or 3 yellow-green safety vests or t-shirt (if permitted in respective Division) and orange cap or orange hard hat. Orange covers can also be worn over other color hard hats. For night time work, the use of ANSI 107-2004 or equivalent revision Class 3 yellow-green safety vest or t-shirt (if permitted in respective Division) is highly recommended.
4. Always set up flagging stations so that they are highly visible to traffic with good approach sight distance. The flagger shall be a minimum of 500’ from an erected Flagger Sign but never standing in a curve. Flagging Stations shall be illuminated for night time operations.
5. NEVER stand in a lane that is open to traffic.
6. Work zone traffic control warning signs and STOP/SLOW paddles shall meet current MUTCD standards, be clean, and legible. Signs shall be mounted on a Staff to allow for traffic to see over the 1st stopped car. Always remove signs when flagging operations are not in progress.
7. Identify and use escape routes in case of emergency and always face oncoming traffic. Discuss best/worst case scenarios with your supervisor when flagging on a bridge.
8. Give clear and concise signals/messages to drivers and coordinate with other flaggers.
9. Flaggers should be in communication with each other or maintain visual contact.
10. Be aware of moving equipment in the work zone. Always establish eye contact with the operator before approaching equipment.
11. Air horns and other Alert Systems should be used when available to alert workers of emergency situations such as unexpected entry or intrusion into work zone.

Related SOP’s

General SOP’s.................................Chapter 10      SOP 11B-44......... Inmate Labor
SAFE OPERATING PROCEDURES

Hazardous Materials SOP 10-10

Below are the responsibilities of supervisors and employees when dealing with hazardous materials.

Supervisors

1. Ensure that labels on hazardous materials are legible when the material is received and that they are maintained in a legible condition. Containers should be stored with warning labels visible.
2. Maintain the collection of Material Safety Data Sheets in a good condition and to ensure employee access as requested.
4. Maintain records of employees’ training.
5. Insure employees are provided with and instructed on the use of any personal protective equipment that may be necessary for working with the hazardous materials.
6. Provide proper devices and containers for transfer of hazardous material.

Employees

1. Acquire the necessary training before working with any hazardous material.
2. Review chemical labels for procedures to follow, personal or environmental hazards and safety information.
3. Acquire and wear necessary personal protective equipment before working with any hazardous material.
4. Use acceptable containers for transporting hazardous material.

Related SOP’s

General SOP’s.................................Chapter 10
Hot Weather Safety

1. Supervisors should schedule heaviest work during the cooler morning hours whenever possible. Risk factors which should be considered include high temperature, high humidity, high exertion, heavy loads/gear, and repeated strenuous days as part of scheduling or rescheduling work.

2. All employees who have not been working in a hot environment must adjust to the heat before expecting to be fully productive. It may take 10 - 14 days of gradually increasing heat exposure before employees become acclimated to working in hot conditions.

3. Employees should drink 2 cups of water before beginning work. Then 2-4 additional cups should be taken during each hour of work. Avoid caffeinated and energy drinks which contain high caffeine or sugar content. Sport drinks such as Gatorade should be considered when working in hot conditions for more than 2 hours to replace electrolytes.

4. Employees must begin drinking fluids before they feel thirsty to avoid heat-related problems.

5. Employees should not take salt tablets but should get extra salt through their normal meals.

6. Light meals are better than fatty foods as they are easier on the digestive system.

7. Frequent, short breaks in the shade are better than infrequent, long ones.

8. Employees should wear the proper clothing such as loosely woven cotton shirts, sunglasses, sweatbands, and the proper footwear. Light colored clothing retains less radiant heat than dark colored clothing.

9. Cooling bandannas (P/N 135005940) are available through Central Inventory.

10. Supervisors should ensure that each crew has adequate water and that employees are allowed enough break time for drinking and recovery purposes.

11. Employees must remember that a lack of sleep, obesity, alcohol use, medication use, and other health related issues can increase the risk of heat related injuries.

Related SOP’s

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</table>
SAFE OPERATING PROCEDURES

Housekeeping and Sanitation  
SOP 10-12

1. Good housekeeping is important for maintaining a safe workplace.
2. Each employee is responsible for maintaining a clean and sanitary workplace.
3. All materials must be properly stored with stock being placed neatly in racks or bins wherever possible.
4. Clear all floors and walkways of tripping hazards on a regular basis. Marked aisles must be kept clear of obstructions.
5. Maintain all floors, decks and working surfaces in non-slippery condition by removing spills as soon as possible. Any non-slip material should be inspected on a regular basis for wear.
6. Place trash in proper receptacle. Do not throw it on the floor or ground.
7. Provide a waste receptacle that is in good condition and appropriate for the type of waste material.
8. Clean all machinery regularly and keep free of shavings, excess oil and pieces of stock.
9. Oily waste, rags or other flammable material shall only be stored in the proper metal receptacles.
10. Materials should not be stored where they block access to fixed ladders, stairways, electrical switch boxes, fire fighting or other rescue equipment.
11. Hand tools should be neatly stored in a designated place.
12. Food or beverages should not be consumed in any area exposed to toxic materials or infectious agents.
13. Shields and guards will be provided on grinders, air compressors and other belt driven equipment in accordance with applicable regulations. Machines with removed or improperly functioning guards or shields shall not be operated.
14. Ample space for each employee to work safely and to achieve a sound footing shall be provided.
15. Ample light for the work to be performed will be provided.
16. Any person working in shop area shall wear steel toe shoes.
17. Maintain all air, hydraulic lines and electrical cords in good repair.
18. Provide adequate fresh airflow in work area.
19. Follow proper safety procedure for use of all power tools and equipment.

Related SOP’s
General SOP’s.................................Chapter 10
SAFE OPERATING PROCEDURES

Lifting

1. Before lifting the load, think of alternate means of moving it (push, pull, roll, pour or pump).
2. Have firm footing and make sure the standing surface is not slippery.
3. Determine the best way to hold the load using any handles, gripping areas or special lifting tools. Get a firm grip on the load.
4. Keep your back straight by tucking your chin in.
5. Tighten your stomach muscles and lift with your legs.
6. Lift the load slowly. DO NOT JERK!
7. Hold the load as close to the body as possible. Be sure you position the load close to the body before lifting.
8. Do not twist during your lift or when moving the load. Turn with your feet, not with your back.
9. Set the load down gently. Use your legs and keep your back as straight as possible.
10. Be sure your fingers are out of the way when putting the load down and when moving the load through tight spaces.
11. Don’t try to be a superman. Ask for help if you need it and use mechanical means whenever it’s available.

Related SOP’s

General SOP’s.................................Chapter 10
SAFE OPERATING PROCEDURES

Office Safety

Hazard Review

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<tr>
<th>Workstation Design</th>
<th>Material Storage and Handling</th>
<th>Pinch Points</th>
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<td>Lifting</td>
<td>Slip, Trip and Fall Hazards</td>
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</table>

1. Perform a Hazard Risk Assessment.
2. Know where building emergency exits are located. These areas should not be used for storage or be blocked. Access ways should be kept clear at all times. Walkways within the office should be open and not restricted by stacked boxes or garbage.
3. Electrical cords, computer, communication and phone lines must be secured to prevent tripping. Carpet and desk mats must be secured to prevent tripping or falling.
4. File drawers should be closed immediately after use so no one can run into or trip over them. Only one drawer should be opened at a time to prevent the cabinet from falling forward. Use caution when closing drawers.
5. Avoid handling supplies more than once by putting materials in their stored location upon receiving them.
6. Always use proper lifting techniques. Use mechanical lifting devices and/or ask for assistance when moving heavy and/or bulky items.
7. Never walk with items stacked so high that your vision is obstructed. Do not stack items in such a manner that they are unstable.
8. Be aware of and keep hands and fingers out of pinch points throughout the office, especially desk drawers, file cabinets and stacked materials.
9. Eating, drinking or smoking should be avoided around office equipment and computer terminals. Paper clips and staples should be used with caution around copying equipment and keyboards.
10. Be aware of stress and strain associated with the use of video display terminals and poorly arranged workstations. Arrange your workstation so that excessive reaching and poor posture is eliminated. Your arms and shoulders should be at a rest position and your wrist should not rest against the edge of the desk.
11. Office equipment such as chairs and desks that are broken and are a safety hazard should be labeled as “Broken, Do Not Use” and removed from the area until they are repaired or replaced.
12. To prevent slips on wet floor surfaces, facility entrances with smooth tile or concrete flooring shall be covered with an absorbent mat that has a non-skid backing. Use signs or cones to alert others of wet floor surfaces. Any wet areas found on floors shall be cleaned up immediately. Employees should be reminded to consider that shoe soles with tread offer better traction during wet weather.

Related SOP’s

General SOP’s.......................................Chapter 10  Computer Data Entry .................................10-3

Office Safety – SOP 10-14
# Safe Operating Procedures

## Personal Protective Equipment - DMV

### SOP 10-15

### Data Entry Operator
- Adjustable chair with arm rest
- Anti-glare screen
- Document holder
- Foot rest
- Padding for wrist protection

### Law Enforcement
- Equipped vehicle
- Coveralls
- Bulletproof vest (if issued)
- Weapon
- Handcuffs
- Flashlight, flares
- First aid kit
- Safety stand/traffic cone
- White gloves
- Rubber gloves
- Reflective vests
- Baton
- Whistle

### Firearms Training
- Ear protection
- Safety glasses
- Bulletproof vest (if available)
- First aid kit
- Radio communication

### Process Officer
- Hand held radio
Personal Protective Equipment

Hazard Review

The following are guidelines/requirements for the use of personal protective equipment (PPE). A hazard assessment at each work site will determine what PPE is required for hazards identified, so it shall be the Supervisor’s responsibility to conduct the hazard assessment with the crew to determine if additional protective equipment is necessary and to ensure that the appropriate equipment is worn. The failure to wear appropriate PPE could result in disciplinary action.

Note: Hazard assessment has determined that the use of ear buds or other listening devices used to listen to music while performing work related tasks is prohibited. This action is a distraction which may affect the safety of the employee wearing them and other workers in the immediate area. Listening to music must be done during breaks, lunch, and before or after work hours. Supervisors must enforce this requirement to ensure the safety of all workers.

Hard Hats shall be worn:

1. On job sites where employees may be exposed to equipment with swinging components being operated such as backhoes, excavators, cranes, etc.
2. When working in areas where there is a potential for injury to the head by falling objects.
3. When exposed (or reasonably expected to be exposed) to flying material (e.g., brush chipper)
4. When exposed to overhead electrical conductors where shock hazard exists, Class E hard hats shall be worn.
5. At the direction of the supervisor.
6. Shelf life of hard hat begins when first issued from stock, not the manufactured date code indicated on the hard hat. It is recommended that the date issued from stock be marked on inside of the hard hat w/ waterproof marker. Hard hats should be replaced 5 years from the date it was put into service.
7. During winter weather, hoodies should not be worn under hard hats. Winter liners made for hard hat use during winter weather should be worn instead.

Orange Caps shall be worn when flagging traffic except in hard hat areas. For hard hat areas, Orange hard hat or orange hard hat cover shall be worn.
ANSI 107 Class 2 Safety Vest or High Visibility Apparel shall be worn:

1. When exposed to moving traffic or equipment.
2. When working within the right-of-way.
3. When determined by the supervisor.
4. When operating equipment within the right-of-way and without an enclosed cab.
5. ANSI Class 3 safety vests or High Visibility Apparel are recommended for nighttime operations.

Safety Glasses with side protection shall be worn:

1. Whenever there is risk of injury to the eye injury from impact hazards such as flying fragments, objects, large chips, and particles.
2. When operating various power tools or machines (e.g., weed eaters, woodworking tools, power or concrete saws, rock drills, chippers, jackhammers, brush chippers, etc.) which may throw particles.
3. When determined by the supervisor.
4. By any person in a shop area outside of designated aisles or marked areas.
5. When jump-starting a battery.
6. Reader Safety Glasses are available through Central Inventory.
7. Provision for prescription safety glasses purchased through Correction Enterprises are available.
   - NCDOT will cover 100% of the cost for prescription safety glasses except that employees who wear prescription glasses must pay for the cost of the examination. NOTE: All prescription safety glasses require side shields.
   - If yearly eye exam shows prescription has changed, employee is eligible for new prescription safety glasses.
   - Check with your supervisor for details.

Safety Goggles shall be worn:

1. When their use is more appropriate than that of safety glasses (as determined by the supervisor).
2. Whenever there is a need to protect the eye from dust, sawdust, and mist (e.g., during sandblasting, sawing, or pressure washing) which can enter or blow into an employee’s eye although they are wearing safety glasses.
3. Whenever there is a danger of a foreign object entering through the side of the glasses.
4. When working with chemicals that may be acidic, caustic, or pose eye hazard based on SDS.
### Face Shields shall be worn:

1. When there is danger of splashing chemicals or other substances that may cause injury to the face or neck area (pressure washing, grinding, drilling, etc.).
2. Whenever, in the judgement of the supervisor, their use is more appropriate than other eye protection.
3. When removing or installing a battery.
4. When working with chain saws, strings trimmers, brush cutters and wood chippers.
5. Safety glasses must be worn under face shield to protect against impact hazards that may exist.

### Appropriate Gloves for Hazard shall be worn:

During any operation where there is a risk of abrasion, laceration, burns, blisters or puncture to the hands. Special impermeable gloves shall be worn when picking up dead animals, working with hazardous chemicals or as directed by the Safety Data Sheets.

**Typical Operations include:**

<table>
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<tr>
<th>Hot mix paving or patching</th>
<th>Fence and guardrail repair</th>
<th>Sign repair</th>
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<tr>
<td>Sharpening tools</td>
<td>Welding and grinding</td>
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</tr>
<tr>
<td>Tree trimming and related activities</td>
<td>Loading or unloading tanker or distributor</td>
<td>Operating chain saws, weed eaters or other gas-powered tools</td>
</tr>
<tr>
<td>Handling lumber</td>
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</tbody>
</table>

### Foot protection shall be worn:

By all employees when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, or when the use of protective footwear will protect the affected employee from an electrical hazard, such as a static-discharge or electric-shock hazard, that remains after the employer takes other necessary protective measures except those who do not have regular exposure to hazardous conditions (e.g., office personnel).

Current safety toe shoes or boots allowance for DOT:

1. $150 each year
2. $225.00 every two years

Foot protection includes safety shoes or work boots, toe caps, or special orthopedic shoes and must meet ASTM F2412-05 and ASTM F2413-05. If an employee, due to health reasons or physical abnormalities, cannot wear safety shoes then toe caps shall be worn. If an employee, due to health reasons or physical conditions cannot wear toe caps, then special orthopedic safety shoes or boots constructed under the supervision of a physician shall be worn. If an employee, due to health reasons or physical conditions, cannot wear special orthopedic safety shoes or boots, efforts will be made to move the employee to a position with no exposure to foot hazards.
<table>
<thead>
<tr>
<th><strong>Coveralls or long-sleeved shirts should be worn:</strong></th>
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</thead>
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<tr>
<td>1. When welding or cutting.</td>
</tr>
<tr>
<td>2. When exposed to poison oak, ivy or sumac.</td>
</tr>
<tr>
<td>3. When exposed to hot materials while hot mix patching or paving, crack sealing or placing thermoplastic markings.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Rubber boots shall be worn:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When required by the Safety Data Sheets.</td>
</tr>
<tr>
<td>2. When mixing and applying pesticides.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Fall Protection Devices (Full Body Harness and Lanyard) shall be worn:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>While working on unguarded work platforms or surfaces where the fall would be six feet or more. Only shock absorbing lanyards shall be used to limit the fall arresting force from the fall. It is recommended that a 4 or 6 ft. shock absorbing lanyard be used for this purpose after determining fall clearance distant to prevent contacting the ground in event of a fall. Self-retractable lanyards may also be used in place of shock absorbing lanyards and are recommended if fall clearance distance is not sufficient for safe use of 4 or 6 ft. shock absorbing lanyard. Self-retractable lanyards limit fall distance to 2 ft.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Fall Restraint Devices (Full Body Harness and Restraint) shall be worn:</strong></th>
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</thead>
<tbody>
<tr>
<td>When in the bucket for Aerial Truck Operations. It is recommended that a retractable lanyard or short restraint lanyard which limits the fall to 2’ to be used for this application. The intent is to prevent the employee from being ejected from the bucket for any unexpected movements or malfunctions with the Aerial Truck operation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Respirator Protection shall be worn:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When employees must work in environments where harmful dusts, fogs, smoke, mists, fumes, gases, vapors, or sprays are present.</td>
</tr>
<tr>
<td>2. Where toxic substances are present in the workplace and engineering controls are inadequate to eliminate or reduce them below the OSHA Permissible Exposure Limits.</td>
</tr>
<tr>
<td>3. When required by the product label or the Safety Data Sheets.</td>
</tr>
<tr>
<td>4. When mixing and applying certain herbicides.</td>
</tr>
<tr>
<td>5. When welding or cutting on galvanized metals.</td>
</tr>
<tr>
<td>6. When sandblasting</td>
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<tr>
<td>7. When working with bridge steel containing lead based paint</td>
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<tr>
<td>8. When spray painting.</td>
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<tr>
<td>9. When determined by the supervisor</td>
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</tbody>
</table>
Hearing Protection shall be worn:

Whenever the noise levels in the work environment exceed 85 dbA. (The noise level can be determined by your Safety Engineer.

*Examples include:*

<table>
<thead>
<tr>
<th>Sandblasting</th>
<th>Jackhammers</th>
<th>Concrete Saws</th>
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<tbody>
<tr>
<td>Pile Drivers</td>
<td>Chain Saws and Weed Eaters</td>
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</table>

*All types of heavy equipment (dozers, loaders, graders, mixers, etc.) may require hearing protection. This equipment is included in the ongoing testing by the Safety and Risk Management and employees will be advised on individual basis.*

Life Jackets shall be worn:

When working over or near water, where the danger of drowning exists.

1. All life jackets shall be U.S. Coast Guard approved.
2. All life jackets shall be inspected for defects that would alter the strength of buoyancy.
3. Defective life jackets shall not be used.

Chain Saw Chaps shall be worn:

1. When using chain saws.
2. When determined by the supervisor
3. Chain saw chaps should be wrap-around type offering 360-degree leg protection.

Clothing NOT appropriate for NCDOT use:

1. Shorts
2. Tank tops that expose bare shoulders
3. Sandals or canvas shoes
SAFE OPERATING PROCEDURES

Poisonous Snakes, Spiders, Insects and Plants  SOP 10-17

Hazard Review

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<th>Tick bites</th>
<th>Insect stings</th>
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<tr>
<td>Poisonous plants</td>
<td>Cuts</td>
<td>Punctures</td>
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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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<th>Insect repellent</th>
<th>Safety toe shoes/boots with ankle protection</th>
<th>Long sleeve/legged clothing</th>
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<tr>
<td>Puncture resistant work gloves</td>
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</table>

1. Employees should utilize Operational Risk Management prior to beginning work. Employees should wear work boots, long pants and long sleeved shirts when going into areas where snakes may be.
2. Employees should avoid wearing perfumes, aftershaves, etc., to minimize attraction of snakes or insects.
3. Work should be scheduled in infested areas during the cool months.

Snakes

1. Wear high top safety toe boots with ankle protection.
2. Employees should make as much noise as possible when approaching a possible snake area to give the snake time to leave.
3. Employees should be equipped with a bush axe for clearing underbrush and for protection.
4. Employees should avoid reaching or stepping into hidden areas whenever possible.
5. If a snake bite should occur, the employee should:
   a. Remain as calm as possible.
   b. Move away from the snake.
   c. Apply a constricting bandage (not tourniquet) between the wound and heart. A finger should be able to pass under it. Apply ice, if available, to bite area.
   d. Allow a fellow worker to transport him/her to the closest medical facility.
   e. Identify the snake and alert medical facility of type.
6. Under no circumstances should incisions and suction be used.

Insect Sting or Spider Bite

Employees should:
1. Wear light-colored, smooth-finished clothing.
2. Avoid areas where spiders or insects might be whenever possible.
3. Avoid highly fragrant after-shaves, colognes, etc., that may attract insects.
4. Use available insect repellent (Spray Insect Repellent DOT #134002049).
5. If a sting or bite does occur, any stinger should be removed with a knife blade or fingernail. The area should then be treated with Sting Kill Swabs (DOT #134001850) and/or Hydrocortisone (DOT #134002350). Employees that are aware they may be allergic to insect bites should carry their prescribed EpiPen, alert other employees they are allergic to certain types of insects, and explain to them what they should do in the event the allergic employee is stung and becomes unresponsive.
6. In the event of a sting, if medical attention is not readily available, consider seeking medical treatment.

### Ticks

*Ticks are especially important to pay attention to because of the possibility of Rocky Mountain Spotted Fever or Lyme Disease.*

To minimize exposure, employees should follow these guidelines:

1. Wear appropriate clothing when working in wooded areas.
2. Check yourself at least twice a day, paying particular attention to the hair, neck and groin area.
3. Use the available Tick Repellent (DOT #34-02050).
4. Notify your supervisor if a tick is found and request that the date and condition (i.e. attached? crawling?) be noted for future reference. (If possible retain engorged ticks and place in a container for identification of the tick type.)
5. Call your NCDOT preferred provider if fever, chills, headaches or muscle aches develop within 3-10 days after exposure. In some cases, a rash may develop on the wrists and ankles 1-3 days after the fever begins.

### Poisonous Plants

*NCDOT employees typically have exposure to at least three types of poisonous plants: poison oak, poison ivy and poison sumac. Reactions can range from mild (very little or none) to severe (rash and blisters). Employees who have no reaction may not have become sensitized; but once they are, future exposures may result in an allergic reaction.*

To avoid problems with poisonous plants, employees should:

1. Learn what the plants look like. Avoid working in severely infested areas if at all possible.
2. Wear long sleeve shirts, long pants, and work gloves. If you are performing clearing activities with either hand (e.g. bush axes, machetes or powered tools), use eye goggles/safety glasses to prevent poisonous plants from contacting your eyes.
3. Use silicone protective or other barrier creams where available.
4. Use TECNU poison ivy wash (NCDOT # 34-01610) on any place that may have been exposed. In some cases, applying TECHNU, even 24 hours after exposure, may help.
5. Ensure that any clothes or shoes that may have been exposed are thoroughly washed. Leftover oils on anything could cause a reaction even days later.
6. If a severe reaction develops, contact your NCDOT preferred provider for possible treatments.
7. Avoid rubbing your eyes if you have been in contact with poisonous plants.

### Related SOP’s

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Poisonous Snakes, Spiders, Insects and Plants – SOP 10-17
SAFE OPERATING PROCEDURES

Sun Exposure

Information for both on and off the job.

1. By far, the most common cause of skin cancer is overexposure to the sun. Ninety percent of all skin cancers occur on parts of the body that usually are not covered by clothing.
2. People who sunburn easily and have fair skin with red or blond hair are most prone to develop skin cancer. The amount of time spent in the sun also affects a person’s risk of skin cancer.
3. To prevent skin cancer:
   a. Cover up with a wide-brimmed hat and a bandanna for your neck. Wear long-sleeved shirts and pants that the sun cannot penetrate.
   b. Use sunscreens to help prevent skin cancer as well as premature aging of your skin. Use a Sun Protective Factor (SPF) rating of 15 or higher. Women may receive added protection by using tinted opaque cosmetic foundation along with a sunscreen. Apply sunscreen at least an hour before going into the sun and again after swimming or perspiring a lot. Do not use indoor sunlamps, tanning parlors, or tanning pills.
   c. You can still get burned on a cloudy day. Try to stay out of the direct sun at midday, because sunrays are the strongest between 10 a.m. and 3 p.m. Beware of high altitudes – where there is less atmosphere to filter out the ultraviolet rays. Skiers should remember that snow reflects the sun’s rays, too.
4. Know your skin. Whatever your skin type, do a monthly self-examination of your skin to note any moles, blemishes or birthmarks. Check them once a month and if you notice any changes in size, shape or color, or if a sore does not heal, see your physician without delay.

Related SOP’s

General SOP’s...........................................Chapter 10
SAFE OPERATING PROCEDURES

Vehicle Operation  
SOP 10-19

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified on each type of vehicle before allowing the vehicle to be operated unsupervised.
3. Drivers shall perform a pre-operational check of their vehicle. Be familiar with operator’s manual.
4. No vehicle shall be operated in an unsafe condition.
5. Drivers and passengers are required to wear seat belts in state vehicles.
6. All loose material such as papers, books, tools radios and brief cases shall be secured to avoid material falling into the floorboard.
7. Drive defensively, observe speed limits and obey all traffic laws when operating vehicles.
8. Plan ahead to minimize or eliminate the need for backing. Utilize a spotter when backing is required. If no spotter is available, operator should physically check behind vehicle before backing.
9. Choose safest location possible to park vehicles. Avoid parking in other vehicle’s blind spots.
10. Dumptruck operators will check for overhead power lines prior to raising the bed.
11. Keep windshield, windshield wipers, side windows and mirrors clean.
13. Remove key from unattended vehicles.
14. Vehicle should not be left running when unattended. If it is necessary to leave a manual transmission vehicle running while unattended (to power warning lights, etc.), the vehicle must be properly secured with wheel chocks in front and back on the same tire.
15. Automatic transmission vehicles, that must be left running while attended, shall have the transmission placed in "Park" with the parking or emergency brake firmly engaged.
16. Vehicles shall be backed into parking spaces whenever practicable.

Related SOP’s
General SOP’s-----------------------------Chapter 10
1. Area supervisors should be aware of the safety of their area and be alert to wet floor hazards.
2. Wet floor signs or cones should be placed at entranceways during times of inclement weather.
3. Housekeeping crews shall inspect entrances and keep water accumulations removed throughout the workday.
4. Door mats should be located inside doorways and length-way with the hall
5. Doormats should be periodically examined for saturation.
SAFE OPERATING PROCEDURES

Work Zone Safety/Traffic Control

SOP 10-21

Required Personal Protective Equipment (PPE)

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<td>Orange Hat or Hard Hat</td>
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1. Follow Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) and the North Carolina Construction and Maintenance Operations Supplement to the MUTCD.
2. For typical daytime operations, the Work Zone Safety guidelines can be used.
3. Before going to the work site:
   a. Have a traffic control plan.
   b. Load needed traffic control devices and check their condition.
   c. Ensure employees have necessary Personal Protective Equipment. Employees exposed to falling objects must wear a hard hat.
   d. Make sure employees designated as flaggers are properly trained and equipped.
4. Vehicles and equipment in the work zone should be parked on the same side of the road in areas that:
   a. Provide safe entrances and exits for the work area.
   b. Do not create potential conflicts with vehicles/equipment operating in the work area.
   c. Provide maximum protection for workers getting in and out of vehicles.
5. Employees should work facing traffic as much as possible. If this is not practical, a lookout should be provided.
6. Employees should be alert to job site hazards and should identify appropriate escape routes.
7. Personnel may be positioned on a truck or trailer for the placement and retrieval of traffic devices in the workzone as long as appropriate fall protection measures are used.
8. When not actively placing or retrieving traffic cones or similar devices, employees must be transported in the cab of the vehicle.
9. Slow moving operations shall utilize a truck mounted impact attenuator behind the placement vehicle whenever possible.
10. Work zones should be inspected frequently to ensure devices are in place and that traffic is flowing adequately. When inspecting, ask yourself, “What is the driver’s view?”
11. Signs should not be left out during lunch or overnight unless necessary.
12. Police support may be useful under certain conditions. (Example: Traffic Signal Technician servicing a traffic signal.) However, they must be notified as early as possible.
13. Be alert to wide or oversized loads progressing through work zones.
14. If possible, avoid working during peak hours on high volume traffic routes.
15. Do not leave equipment (tripods, etc.) unattended when positioned in/adjacent to travel way.
16. Remove traffic control devices in a timely manner and in a manner that provides the workers with the most protection. Devices should be removed in the opposite order from how they were placed. Cones first (in reverse order) with signs last.

Related SOP’s

General SOP’s..........................Chapter 10
SAFE OPERATING PROCEDURES

Working Near Overhead High-Voltage Lines

Hazard Review

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<td>Moving Traffic</td>
</tr>
</tbody>
</table>

Required Personal Protective Equipment (PPE)

| Safety Vest | Hard Hat | Safety Shoes |

1. Prior to beginning job, examine the worksite to determine if there are any overhead high-voltage lines (600 volts or higher) at the worksite. If it is necessary to perform work within six feet (or ten feet for equipment) of overhead high-voltage lines (600 volts or higher), the project supervisor shall immediately contact the utility company, but no later than 48 hours prior to the beginning of the job. The project supervisor shall provide the utility company or their representatives the following information:
   - His/her name, address and telephone number
   - The location of the proposed work
   - The name, address and telephone number of the person responsible for the work
   - The field telephone of the worksite if available
   - The type, duration and extent of the proposed work
   - The name of the person for whom the proposed work is being performed
   - The time and date of the notice
   - The approximate date and time when the work is to begin

2. If it is necessary to perform work within six feet (or ten feet for equipment) of overhead high-voltage lines (600 volts or higher), the project supervisor shall make precautionary safety measures with the utility company that may include any or all of the following:
   - The overhead high-voltage lines being de-energized
   - Temporary placement of mechanical barriers being done to separate and prevent contact between equipment, material, other objects, or persons and high-voltage lines
   - Temporary relocation or raising of the high-voltage lines being done
   - Other precautionary safety measures as recommended by the utility company

3. Perform pre-operational checks of the equipment prior to beginning the job.

4. Ensure that warning signs that state "UNLAWFUL TO OPERATE THIS EQUIPMENT WITHIN TEN FEET OF OVERHEAD HIGH-VOLTAGE LINES" are located within the equipment and is readily visible to the equipment operator and is located on the outside of the equipment to be readily visible to other personnel at the work site.
5. All personnel on the worksite shall wear Class B hard hats which provide protection against high-voltage. Additionally, any other electrical protective devices (e.g., rubber insulating gloves, rubber matting, etc.) shall be used as applicable.

6. No materials or any covered item is to be stored within ten feet of the overhead high-voltage line.

7. The overhead high-voltage line is not to be raised, moved or displaced for any reason unless precautionary safety measures have been made with the utility company.

8. No excavation of any portion of any foundations of the structures, including guy anchors which support any overhead high-voltage lines is permitted.

9. If the equipment does contact an overhead high-voltage line, the equipment operator and other on-board personnel shall remain on that piece of equipment until the overhead high-voltage line is de-energized.

10. If fire breaks out from the contact between the equipment and the overhead high-voltage line, the equipment operator and any other persons, shall jump off the piece of equipment with both legs against each other (not spread apart). These individuals shall then "bunny" jump/hop with both legs against each other for no less than 25 feet but as far as the individuals can get away from the overhead high-voltage line.

**Related SOP’s**

General SOPs.................................Chapter 10  Self-Propelled Equipment SOPs... Chapter 12A

Working Near Overhead High-Voltage Lines – SOP 10-22
SAFE OPERATING PROCEDURES

Work Zone Tail Gate Safety Meetings

1. Tail gate 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.
2. The crew leader or the senior man for the crew shall conduct these meetings.
3. Describe the work that is likely to be performed to the crew.
4. Review and discuss with the crew all safe-operating procedures (SOPs) that relate to the work being performed.
5. Describe and/or show the planned work zone traffic control set-up that will be used to perform this work.
6. Review with the crew, each person's responsibility regarding the traffic control set-up (e.g., sign installation, lane closure setup, etc.).
7. Review the traffic control devices you plan to take to the site and make sure you have what you need to install the traffic control set-up properly.
8. Document what traffic control setup was used (including the sign types and sign locations) and how it was installed. (This is especially important if an accident occurs).
9. For major traffic control set-ups, you may need to plan several days in advance to make sure you have traffic control devices such as truck mounted attenuators, flashing arrow panels, changeable message signs and portable concrete or water filled barriers.
10. You may need to consult with your County Maintenance Engineer and others with more work zone traffic experience when installing major traffic control set-ups.

Work Zone Crew Leader
Location _________________________ Date _________ Name________________________

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<td>1. Do you have the appropriate number and size of message signs that are clean and legible for today's work activity?</td>
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<tr>
<td>2. Do you have the appropriate number and size of cones or drums for today’s work activity?</td>
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<td></td>
<td></td>
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<tr>
<td>3. Do you have the appropriate number of vests, orange hats, stop/slow paddles and trained flaggers for your operation?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Do you have all other needed traffic control devices for today's work activity? List:</td>
<td></td>
<td></td>
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<tr>
<td>5. Have you reviewed the traffic control set-up with the crew?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Have you reviewed related SOPs with the crew?</td>
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Related SOP’s
General SOPs……………………………………Chapter 10
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SAFE OPERATING PROCEDURES

Abrasive and Waterblast Cleaning

Hazard Review

Noise Debris Hazard to Eyes and Uncovered Skin Burns
Crushing Caustic or Volatile Hydrocarbon Liquids Pinching and Cutting
Noxious or Irritating Fumes Moving Equipment High Pressure Air or Liquids
Slip, Trip and Fall Lifting

Required Personal Protective Equipment (PPE)

Safety Vests Hard Hat Hearing Protection
Protective Clothing Safety Shoes Gloves
Safety Glasses/Safety Goggles/Face Shield

1. Know and follow the manufacture’s procedure for operation of this equipment
2. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
3. Check for fluid leaks at the fitting area before the equipment is put into use.
4. Check the trigger lock, and tighten thread connections before each operation. If the trigger lock is faulty or damaged, do not use the spray gun.
5. Check for worn, damaged, perforated, or weakened hoses before using the equipment. If any defects are found, the unit shall be taken out of service until the equipment unit can perform repairs.
6. Shield work area or exclude unprotected personnel from air or water-borne debris.
7. Determine safe routing for electrical cords, air lines and hoses to prevent tripping hazards and unnecessary exposure to ruptured lines
8. Ensure that the wash down gun is always pointed away from another person.
9. Keep hand and body parts away from the spray nozzle tip.
10. Always use two hands and have a secure body stance during spraying operations.
11. Use the lowest rated operating pressure to get the job done and never exceed the maximum rated operation pressure.
12. Never use the spray gun without the spray nozzle or tip installed.
13. Equipment shall be de-pressurized before leaving it unattended.
14. Keep the gun handle clean and dry to allow for positive grip.
15. Avoid touching metal parts of the gun when spraying hot liquids; otherwise, severe injury can occur.
16. DE-ENERGERIZE all equipment by shutting it off, setting the trigger in the locked position and drain the fluid in the hose and gun before attempting to remove the spray nozzle or tip.
17. Where differences in elevation exist, wash out driveway pipes from the low to the high end.
18. If use in a potentially explosive or flammable environment, proper ventilation must be provided and the gun must be properly grounded.
19. In case of skin penetration from the spray, immediately contact your supervisor. Always seek medical assistance if skin penetration from the spray occurs.

20. Only the equipment unit is authorized to perform maintenance repairs on this equipment.

21. Review and follow the SOP’s for Trailers and Towed Equipment. (Chapter 12-B)

Related SOP’s

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SAFE OPERATING PROCEDURES

Boiler Operations

Hazard Review

- Noise
- Noxious Fumes
- Slip, Trip and Fall
- Dark Work Areas
- High Pressures
- Flying Debris
- Lifting
- High Temperatures
- Flammable Materials
- Pinch Points
- Moving Equipment
- Confined Spaces
- Flying Objects
- Rotating Machinery

Required Personal Protective Equipment (PPE)

- Safety Shoes
- Protective Clothing
- Safety Glasses/Safety Goggles
- Gloves
- Hearing Protection

1. Review Safe Operating Procedures for applicable equipment and perform pre-operating checks.
2. Be aware of loose or slippery materials, tripping hazards and other obstructions. Take appropriate measures to eliminate these conditions.
3. Determine routing for electrical cords and equipment lines to avoid tripping hazards.
4. Proper lifting techniques shall be used. Get help or use equipment if necessary.
5. Ensure adequate ventilation.
6. Be aware of first aid kit, fire extinguishers, alarm and hose locations. Check routinely to make sure they are working properly. Follow good housekeeping practices to reduce risk of fires, slipping and tripping.
7. Ensure ready access to and operating conditions of eye washers and emergency showers in case of exposure to skin and eye irritants.
8. Be particularly aware of wet stains on insulation, piping and associated joints that may indicate a small leak that could become a major steam leak.
9. Correct fuel leaks immediately, securing boilers or other heat sources as appropriate.

Related SOP’s

- General SOP’s..............................................Chapter 10
- Electrical Installation/Repairs......................11A-4
- Hydraulic System Repairs..............................11A-11
- Maintenance and Repair Shops (General)........11A-21
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SAFE OPERATING PROCEDURES

Dyno Room

SOP 11A-3

Hazard Review

Noise
Noxious Fumes
High Temperatures

Debris Hazard to Eyes and Uncovered Skin
Slip, Trip and Fall
High Pressures

Lifting Heavy Objects
Flying Objects
Rotating Machinery

Required Personal Protective Equipment (PPE)

Hearing Protection
Protective Clothing

Safety Glasses/Safety Goggles
Safety Shoes

Gloves

1. Review Safe Operating Procedures for applicable equipment and perform pre-operating checks.
2. Be aware of loose or slippery materials, tripping hazards and other obstructions. Take appropriate measures to eliminate these conditions.
3. Determine routing for electrical cords and equipment lines to avoid tripping hazards.
4. Proper lifting techniques shall be used. Get help or use equipment if necessary.
5. Inspect chains, hoist and lift rings prior to use.
6. Ensure engine is securely mounted and all connections are secure prior to start-up.
7. Ensure adequate ventilation when equipment is operating.
8. When tests are in progress, stay in operating booth and prevent entry by others to test area.

Related SOP’s

General SOP’s..................Chapter 10
Hydraulic System Repairs...........11A-11
Mechanic Operations ...............11A-22
Truck, Fuel and Lube ...............12A-32

Electrical Installation/Repairs.................11A-4
Maintenance and Repair Shops (General) ....11A-21
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SAFE OPERATING PROCEDURES

Electrical Installation/Repairs

Hazard Review

Electrical Shock
Overhead Loads
Crushing or Pinching Injuries
Slip, Trip and Fall
Poisonous Plants/Snakes/Insects
Confined Space
Moving Traffic and Equipment
Lifting

Required Personal Protective Equipment (PPE)

Hard Hat
Safety Shoes
Gloves
Safety Vest

1. Do not attempt to make any electrical repairs unless qualified or properly supervised.
2. Review Safe Operating Procedures for job required.
3. Review plans to determine electrical hazards and ways to protect operators.
4. Locate all utilities in and near the work site.
5. Evaluate site and follow excavation and trenching guidelines.
6. Avoid walking and working under suspended loads.
7. Use proper lifting or pulling techniques. Get help or use equipment if necessary.
8. Be aware of crushing or pinching hazards in jointing pipe and conduit.
9. Rubber boots may be needed in wet ditches.
10. Employees must use extreme caution to stay clear of moving equipment.
11. Establish eye contact with operator before approaching equipment.
12. Use proper tools for the work required.
13. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
14. Allow ample workspace for each employee.
15. Park in areas that provide safe entrance and exit of work areas.
16. Locate and use all electrical lockout devices and tags properly.
17. Locate all fire extinguisher and first aid kits at each job site.

Related SOP’s

General SOP’s........................................Chapter 10
Traffic Services’ Shops and Warehouse.....11A-36
Traffic Signal Installation/Maintenance.....11B-82
Truck, Aerial Device.............................12A-26
Ferry Marine Maintenance Facility.........11A-7
Power Building

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SAFE OPERATING PROCEDURES

Equipment/Automotive Painting

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Required Personal Protective Equipment (PPE)

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1. Review Safe Operating Procedures for applicable equipment and materials safety data sheets for recommended safe handling of materials to be used. Make sure that MSDSs are readily accessible to work area.
2. In case of spills or leaks, secure ignition sources. Scoop materials into proper containers for disposal. Keep on hand inert absorbent aid, such as oil dry or rags.
4. Dispose of waste in appropriate containers and in accordance with federal, state and local regulations.
5. Store paints and other flammable materials in appropriate cabinets or containers. Keep away from heat and provide adequate ventilation. Open only enough materials and supplies to perform job at hand.
6. The use of over garments, gloves, creams, etc. is recommended to reduce damage to skin.
7. Know overexposure effects and emergency first aid procedures.
8. Ensure that safety equipment is within reach and in proper working order. Eyewashes, fire extinguishers and a first-aid kit must also be available.
9. Use only proper equipment and maintain it in accordance with recommended procedures.
10. Assure that fittings and connections are kept tight and that air hoses and pressure hoses aren’t frayed or leaking. Ensure that air pressure is regulated, applying only enough pressure to operate the equipment being utilized such as spray gun, pressure pot spray apparatus, sanders and grinders.
11. Maintain proper exhaust and airflow within spray booth; monitor air flow meters.
12. Ensure that all spray booth safety features are operable and that spray booth warning bell is functional.
13. Keep exhaust filters changed as required or necessary. Keep paint overspray build-up to a minimum by frequently changing paper on spray booth floor. Keep filters on inlet side of booth changed.
14. Use only properly fitted, approved respirators. When using a positive pressure air supplied respirator, assure that hood and hoses are free of tears and breaks and that air pump inlet filter is frequently inspected and changed as needed.
15. Maintain proper warning signs in the paint shop. Signs informing of paint spraying operations, flammability dangers, no smoking and no open flames should be located both
inside as well as outside the paint area. “No parking” signs should be posted and enforced at the entrance and exit to ensure they are not blocked.

16. When working alone in the spray booth, there should be another worker nearby to provide assistance in the event of an emergency.

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SAFE OPERATING PROCEDURES

Equipment Body Repair

Hazard Review

| Toxic Fumes | Cuts and Pinch Points | Solvents |
| Reactive Materials | Slip, Trip and Fall | |

Required Personal Protective Equipment (PPE)

| Safety Shoes | Protective Clothing | Respirator |
| Gloves | Safety Glasses/Safety Goggles/Face Shield | |

1. Review safe operating procedures for applicable equipment.
2. Review Materials Safety Data Sheets for material to be used.
3. In the event of spills, extinguish all sources of flame and ignition, absorb with inert material such as vermiculite or sand, sweep up and collect in container for disposal as solid waste.
4. Extinguish open flames when using plastic body fillers.
5. Thoroughly wash any skin with soap and water that has been exposed to harmful solvents or other materials.
6. Assure ventilation adequate to draw dust and fumes away from work area.
7. Dispose of waste and scrap in accordance with policy and regulations.
8. Take special precautions to avoid cuts to hands and fingers caused by burns and sharp edges on metal parts.
9. Assure shields and guards are in place on all machinery.
10. Use only approved jacks and jack stands and assure they are rated for the load to be lifted.
11. Maintain a neat, clean and orderly work place.
12. Never use unknown or outdated chemicals or materials.
13. Assure any electrical or mechanical equipment is in good repair.
14. Report all malfunctioning equipment to supervisor.
15. Proper lifting techniques shall be used. Get help or use equipment if necessary.

Related SOP’s

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| Maintenance and Repair Shops (General) ..11A-21 | Mechanic Operations .......................................11A-22 |
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SAFE OPERATING PROCEDURES

Ferry Marine Maintenance Facility-Power Building

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Required Personal Protective Equipment (PPE)

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1. Eye protection, rubber gloves and apron shall be worn when working on batteries.
2. Take extra precautions to prevent heat stress when working in extremely hot temperatures. Leave building if necessary. Drink plenty of fluids.
3. Always stand on rubber padding when working around electrical transfer and monitoring systems. Keep floors dry, especially near electrical equipment.
4. Be alert for sprayed fuel, lube oil, or engine cooling water from pressurized systems. In case of fire, shut off equipment immediately. If conditions permit, shift power to another generator. Activate fire alarm system.
5. Be aware of fire extinguishers, alarm and hose locations. Check routinely to make sure they are working properly. Follow good housekeeping practices to reduce the risk of fires.
6. Avoid contact with engine manifolds, turbines, piping, etc., which build up high temperatures that can cause severe burns.
7. Standby diesel generators and air compressors start and stop automatically; stay clear unless the equipment is de-energized, locked and tagged out.
8. Periodically observe all equipment for malfunctions and be alert for loose electrical connections that may be indicated by spattering (hissing) noises, arcing and burn marks.
9. Equipment shall be operated in a safe manner as established in applicable training programs and manufacturer’s guidelines.
10. Be aware of loose or slippery materials, tripping hazards and other obstructions. Take appropriate measures to eliminate them.
11. Review MSDS for each chemical used.

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SAFE OPERATING PROCEDURES

Glass Cutting

SOP 11A-8

Hazard Review

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Required Personal Protective Equipment (PPE)

| Safety Shoes | Safety Glasses/Goggles/Face Shield | Gloves |

1. Be aware of first aid kit locations and check routinely to make sure they are complete.
2. Use proper lifting and handling techniques. When required, use overhead cranes, forklifts or another person.
3. Do not wear loose fitting clothes or neckties.
4. Before beginning a job, ensure a neat orderly workspace with sufficient clearance for handling raw material, finished goods and scrap.
5. Be aware of loose or slippery materials and other obstructions. Take appropriate measures to eliminate them.
6. Practice good housekeeping techniques, keeping the area clear of broken materials that present safety hazards.
7. Be certain materials are stored properly to prevent damage and avoid safety hazards.
8. Be certain materials are positioned properly before performing and working or cutting operations.
9. Use appropriate glass handling devices when positioning glass in frames.

Related SOP’s

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SAFE OPERATING PROCEDURES

Hoisting/Jacking SOP 11A-9

Hazard Review

Crushing Injuries  Slip, Trip and Fall  Back Injuries

Required Personal Protective Equipment (PPE)

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<th>Safety Shoes</th>
<th>Hard Hat</th>
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1. Use proper safe lifting techniques.
2. Ensure chain hoist or jack is rated for weight being lifted. Operate with safe limits.
3. Assure hoist dollies and beams are rated correctly for shop use and are properly maintained.
4. Assure that the hoist chain and hook are within the allowed wear tolerance as required by OSHA and that the hook is in compliance with a safety latch.
5. Use an approved web or chain sling to hold load.
6. Never get under load being raised or suspended.
7. Assure that area around lift is clear of personnel and obstacles.
8. Ensure that a floor lift is safe to operate and properly maintained.
9. Place vehicles on lift using proper procedures to locate lift brackets under vehicle.
10. Closely monitor vehicle as it is being raised and assure that it is stable on lift.
11. Lock safety rod into place under lift to prevent the lift from leaking down.
12. When lowering lift, assure that area around lift is clear and safety rod is removed. When lift is down, properly secure all lift brackets.
13. Move vehicle from lift area when completed.
14. After the vehicle is raised, place garage stands under the vehicle to provide safe support. Never depend on the floor jack to hold up the load.
15. When work is complete, remove stands, lower the floor jack and secure it in the designated storage area.
16. Block wheels when using above ground lift or when only one end of a vehicle is being lifted.

Related SOP’s

- General SOPs .............................................Chapter 10
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- Tire Repair .................................................11A-35
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- Bridge Jacking ...........................................11B-12
- Roadside Equipment Repair .......................11B-68
- Wrecker ....................................................12A-38
Hose Crimp Machine – SOP 11A-10

SAFE OPERATING PROCEDURES

Hose Crimp Machine

Hazard Review

Cuts, Bruises and Blisters  
Eye Injury  
Pinching and Crushing Injuries  
High Pressure Fluid  
Electrical Shock Hazard

Required Personal Protective Equipment (PPE)

Safety Shoes  
Safety Glasses/Goggles/Face Shield  
Gloves

1. Make sure work area is clean and clear of all hazards.
2. Ensure machine is oiled and that regular preventative maintenance is performed.
3. Keep hands out from under ram at all times.
4. Wear leather gloves when using skiving tools.
5. Keep bottom of die-cage clean.
6. Never re-use any component. Use new components (i.e., hoses, ferrules and stems).
7. Use a magnet to insert proper die halves, one at a time, into base ring.
9. Use proper die and hose assembly components.

Related SOP’s

General SOPs ........................................Chapter 10  
Metal Punching, Forming and Searing ....11A-25  
Lockout-Tagout ....................................... 11E-8  
Roadside Equipment Repair .................11B-68

Hydraulic System Repairs .............................11A-11  
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Hydraulic System Repairs

**SAFE OPERATING PROCEDURES**

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1. Never begin work on a hydraulic system until fully trained.
2. Carefully review the manuals on equipment before beginning work. Ask questions about anything you do not fully understand.
3. Maintain a clean work area free of slipping hazards and debris.
4. Use all required safety equipment.
5. Always use safety glasses.
6. Block, secure or lower to the ground all components that may move, rotate or fall.
7. Relieve system pressures. (Note: Some systems use accumulators that store pressure. Identify the system before working on it.)
8. Use extreme caution when disconnecting hydraulic lines. Severe burns from hot fluid can result.
9. Use test equipment designed for higher pressures than the system being repaired. Use of gauges, lines, connectors, etc., designed for lower pressures can result in bursting or equipment damage. Start with high pressure gauges and work down. (Note: A good rule is to use equipment rated at twice what is expected. Example: For a 2500-psi system, use a 5000-psi gauge.)
10. **DO NOT USE HANDS OR FINGERS** to find leaks. Fluid under high pressure can be injected into skin causing extreme injury and serious infection.
11. Clean up spills immediately. Hydraulic fluid is an oily substance, which can cause slipping, falling and resulting injuries.
12. Do not work under equipment/apparatus being supported by hydraulics. Stops, safety pins, etc. must be in place prior to beginning repairs.
13. Review MSDS’s for all chemicals used.

**Related SOP’s**

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- Ferry Engineering ........................................ 11B-29
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SAFE OPERATING PROCEDURES

Lifting/Fleeting Vessels

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1. Ensure that life rings are readily available.
2. Stay clear of all open gears, cables and moving equipment.
3. Never use more than two turns on the capstan. Do not use excessive pull and keep clear of loose ends and bights in rope.
4. Be aware of loose objects, slippery deck, tripping hazards and uneven docking.
5. Always use signalman with crane, loader and forklift. ONLY LICENSES PERSONNEL SHALL OPERATE THIS EQUIPMENT.
6. All operations shall be under the direction of the Dockmaster, who shall ensure that the Synchrolift is in a safe operating condition.
7. Warning sirens will be sounded prior to Synchrolift operation. Employees shall stand clear of winches and platform when alarm sounds.
8. Use proper lifting techniques when positioning blocks.
9. No unauthorized person shall be allowed in lift house during operation.

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SAFE OPERATING PROCEDURES

Loading/Unloading Freight  

Hazard Review

Lifting  
Crushing Injuries  
Slip, Trip and Fall  
Heat Stress

Required Personal Protective Equipment (PPE)

Safety Shoes  
Gloves

1. Ensure that all trucks or trailers are securely chocked prior to entering with a forklift.
2. Ensure that the hydraulic dock levelers are properly positioned on the bed of the trailer to allow for safe entry.
3. Forklift speeds must be at a minimum to avoid damage to trailers and material. When ramps are wet or icy, special attention is required to avoid slipping or sliding.
4. Care must be taken to avoid hitting pedestrians who may be in the work area.
5. When loading trailers, ensure that all pallets are secured with stretch wrap and properly loaded to avoid shifting while being transported. Use chains or straps to guard against shifting.
6. All heavy pallets should be placed in the front of the trailer to avoid being thrown forward during quick stops.
7. All hazardous material must be properly marked and placards displayed on the trailer to indicate hazardous contents.
8. All forklift operators must be qualified and approved prior to loading or unloading any trailers.
9. Do not load pallets or handtrucks in a manner that blocks vision when moving loads.

Related SOP’s

- General SOPs .........................................Chapter 10  
- Forklift ..................................................12A-6  
- Warehouse ..................................................11A-38  
- Truck, Tractor and Trailer ..............................12A-36
SAFE OPERATING PROCEDURES

M&T Unit – Aggregate Gradations SOP 11A-14

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Required Personal Protective Equipment (PPE)

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<tr>
<td>Gloves</td>
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</table>

1. Use proper lifting techniques.
2. Be aware of possible sharp edges when removing trays from Gilson shaker.
3. Be aware of hot surfaces when placing samples in and removing samples from oven.
4. Wear heat-resistant gloves when removing samples from oven.
5. Use proper ventilation.
6. Be aware of loose objects or aggregate on floor.

Related SOP’s

General SOPs ...............................................Chapter 10
Sampling and Inspection at ................................ 11B-71
Producer’s Facility

M&T Unit-Aggregate Gradations – SOP 11A-14
SAFE OPERATING PROCEDURES

M&T Unit – Bituminous Testing

[SOP 11A-15]

Hazard Review

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Required Personal Protective Equipment (PPE)

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<tbody>
<tr>
<td>Lab coat</td>
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</table>

1. Use proper lifting techniques.
2. Wear heat-resistant gloves when handling hot materials.
3. Be aware of hot surfaces when placing samples in and removing samples from oven.
4. Use tongs to handle hot crucibles in ash correction.
5. Wear rubber gloves when pouring solvents, when placing specimens in hot water and when agitating Ash Correction samples.
6. Use proper eye and/or face protection when pouring materials, mixing ingredients and agitating samples and when around Abson Recovery distillation apparatus.
7. Maintain proper temperature per AASHTO test procedure for Abson Recovery.
8. Use proper ventilation when pouring, evaporating and burning Ash Correction samples and in all distillation or extraction areas.
10. Check to see that gas is off before using any ignition device.
11. Be alert to moving parts of equipment that could injure hands.
12. Maintain a dry floor surface in area of gravity apparatus.
13. Before moving any TRICO barrels, check to see that all openings are closed.
15. Wear film badge when working with nuclear asphalt content gauge.
16. Review MSDS for TRICO, Asphalt Cement, etc.

Related SOP’s

General SOPs .......................................................... Chapter 10
Sampling and Inspection at ....................................... 11B-71
Producer’s Facility
SAFE OPERATING PROCEDURES

M&T Unit – Chemical Testing

Hazard Review

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Required Personal Protective Equipment (PPE)

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<tr>
<td>Splash Goggles</td>
<td>Respirator</td>
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</tbody>
</table>

1. Use proper lifting techniques.
2. Wear proper footwear.
3. Wear protective clothing such as lab coats and aprons.
4. Wear gloves when working with asphalt, when cutting with knives and when cutting wires and other metal articles.
5. Shield ends of wires and rods to prevent them from being propelled across room when cut.
6. When using knives, cut away from body. When breaking glass rods or tubing, hold with rags or use gloves and break away from body.
7. Wear heat resistant gloves when placing samples in and removing samples from oven.
8. Wear solvent proof gloves when cleaning apparatus with solvent.
9. Wear eye protection when boiling samples on hot plates, when opening muffle furnace and ovens, when cutting wires and other metal articles, when pressing pellets, when cutting glass rods and in designated areas.
10. Use proper ventilation when using solvents.
11. Keep flammable solvents away from open flames and electric sparks.
12. Be sure knives and cutters are sharp and in good working order. Check all glassware for cracks and chips and discard damaged glassware.
13. When pressing pellets, check press for leaks in hydraulic system and be sure items being pressed are set flush under press.
14. When distilling liquid samples in glass stills, be sure shield is around still and lids are in place over shield.
15. When running impact test on pipe coating, be sure fingers are clear of impact hammer.
16. When using instruments, be sure cylinders of compressed gas are properly secured, check fittings for gas leaks, do not use lubricant on fittings, be sure burner heads are safely secured and have cooled before handling, and be aware of sharp needles when injecting GC samples.
17. When using autoclave, do not overfill and be sure temperature is down to safe level and open carefully, being aware of escaping steam.
18. When saybolt tubes are being cleaned with solvent, be sure to keep lids on tubes.
19. Wear film badges when working with x-ray equipment.
20. Do not leave unattended beakers on hot plates or burners.
21. Be familiar with the MSDSs for reagent or solvent in use.
22. Transport jugs of reagents in appropriate rubber containers.
23. Know location of safety showers and eye wash.
24. Be sure all reagents are properly labeled. If a bottle is relabeled, old label should be completely removed before adding new one. Do not try to identify unknown by smelling or tasting.
25. Check reagents for dates and properly dispose of outdated chemicals.
26. Do not mouth pipette liquids.
27. Do not eat or drink in designated working areas.
28. Before operating instruments and equipment, verify safety shields and guards are in place and effectively operating.

Related SOP’s

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M&T Unit-Chemical Testing – SOP 11A-16
SAFE OPERATING PROCEDURES

M&T Unit – Physical Testing SOP 11A-17

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Required Personal Protective Equipment (PPE)

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1. Use proper lifting techniques.
2. Wear proper footwear and other personal protective equipment as required.
3. Wear eye protection when sawing pipe, drilling cylinders for calcium nitrite, spraying curing compound, mixing mortar, testing cubes, using bolt cutter and during L.A. machine operations.
4. Keep body parts and clothing clear of moving parts of equipment.
5. Wear hearing protection when drilling cylinders for calcium nitrite, when charging or discharging L.S. machine and when in L.A. room with L.A. machine in operation.
6. Be sure that protective shield is in place when performing compression tests and tensile tests and stand clear of machine during test.
7. Be sure ladder is secure before climbing and do not lean over rails.
8. Be aware of sharp ends and edges of samples and sign panels.
9. Keep fingers and hands clear of cutting edge of bolt cutter and knife-edges of rubber slicer.
10. Be aware of potential falls and trips while performing rotational capacity tests on bolts. Sudden breakage of bolts may occur.
11. Avoid slips and falls from wet floor caused by dripping water from blocks, bricks and stone during absorption test.
12. Do not open weatherometer while it is in operation due to possible exposure to high temperature, acid-water spray and ultraviolet light.
13. Wear heat resistant gloves when placing samples in and removing samples from ovens and curing cabinet and when handling hot samples.
14. Wear chemical resistant gloves when immersing and retrieving samples in sodium sulfate solution and handling glassware exposed to acid.
15. Wear rubber gloves when handling cement, lime, mortar, grout, epoxy, fly ash, slag and rapid repair materials.
16. Wear dust mask when splitting, pouring or scooping dry cementitious and other fine materials and during L.A. machine operations.
17. Use exhaust fan when mixing mortar.
18. Use respirator when spraying curing compound and when exposed to acid cleaning solutions.
19. Read warning labels on all commercial grouts, rapid repair materials and epoxies. Take appropriate precautions to avoid toxic fumes, corrosive materials and other hazards.

**Related SOP’s**

- General SOPs..................Chapter 10
- Hand Tools (Power and Manual)..............12B-13
- Ladder ...........................................12B-15
M&T Unit – Preparing Samples for Physical Testing

Hazard Review

Lifting        Slip, Trip and Fall        Crushing Injuries
Cuts          Noise                       Electrical Shock
Flying Particles dust                     Toxic Fumes
Splashing Molten Sulfur

Required Personal Protective Equipment (PPE)

Safety shoes                 Safety Glasses/Face Shield       Lab coat
Disposable coveralls          Hearing Protection

1. Use proper lifting techniques.
2. Wear proper footwear and other personal protective equipment as required.
3. Wear eye protection when sawing, chiseling, breaking bricks or using mechanical splitter.
4. Wear face shield and gloves when capping with molten sulfur.
5. Wear hearing protection and ensure proper ventilation when sawing.
6. Be aware of crushing hazards of dropping materials and using hammer and chisel.
7. Utilize blade guard and shield on saws.
8. Utilize exhaust fan when capping with molten sulfur.
9. Keep body parts and clothing clear of circular saw.
10. Do not attempt to manually support loads to be sawed.
11. Wear rubber suit when sawing cores or cylinders.
12. Stand on rubber mat when saw is in operation.
13. Maintain dry floor surface in area of bituminous core gravity apparatus.
14. Wait until fog clears before entering moist room.
15. Use caution when walking on wet floor of moist room.
16. Balance all cylinders and cores securely on pushcart and in stacks. Do not stack more than two high.

Related SOP’s

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M&T Unit – Receiving Samples  

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Required Personal Protective Equipment (PPE)

| Safety Shoes | Safety Glasses | Gloves |

1. Use proper lifting techniques and obtain assistance if necessary.
2. Check metal ties on bags for exposed ends and remove ties carefully.
3. Check containers for loose lids and caps and bags for torn places that might rupture.
4. Check samples for sharp points or edges, such as barbed wire points and slivers on reinforcing bars.
5. Wear appropriate personal protection equipment consistent with the hazard, such as safety shoes, safety gloves and safety glasses.
6. Be aware of loose objects, loose aggregate, uneven floor and other environmental hazards.

Related SOP’s

General SOPs.................................................. Chapter 10
SAFE OPERATING PROCEDURES

M&T Unit – Soils Testing

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Required Personal Protective Equipment (PPE)

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<tbody>
<tr>
<td>Gloves</td>
<td>Respirator</td>
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</table>

1. Use proper lifting techniques.
2. Wear proper footwear and other personal protective equipment as required.
3. Wear safety glasses when using compressed air and do not place compressed air nozzle against skin.
4. Gloves, dust masks and hearing protection are to be used when hazard warrants.
5. Be aware of hot surfaces when placing samples in and removing samples from oven.
6. Wear heat-resistant gloves when handling hot materials.
7. Use tongs when removing samples from oven.
8. Be aware of crushing hazards of dropping materials.
9. Be alert to moving parts of equipment that could injure hands.
10. Use safety latch on compactor when placing mold on and removing mold from compactor.
11. Grasp molds and triaxial cells with both hands when moving items.
12. Hold rammer approximately two inches below top of cylinder casing while pulling hammer with other hand.
13. Unplug mixer before changing blade.
14. Be sure to allow enough clearance when placing glass cylinders in water bath and when removing them from water bath so the cylinder does not hit edge of water bath.
15. Be aware of loose objects or aggregate on floor.
16. Maintain a dry floor surface in soil mechanics section.
17. Stack bags of material on cart in a balanced and secure pattern.
18. Be alert to possible splinters from shelves when placing or removing samples on shelves in drying room.

Related SOP’s

General SOPs .................................................Chapter 10
Hand Tools (Power and Manual) ............... 12B-13
Air Compressor ........................................... 12B-1
SAFE OPERATING PROCEDURES

Maintenance and Repair Shops (General) – SOP 11A-21

Hazard Review

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Required Personal Protective Equipment (PPE)

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<th>Hearing Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
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</tbody>
</table>

1. Be aware of the wide variety of chemicals, cleaning agents, degreasers, paints thinners and other combustible materials used in the shops. Read and follow warning labels on containers and on MSDS’s, to ensure materials are handled and stored properly.

2. Be familiar with the Facility Contingency Plan. Notify the supervisor if a hazardous substance is spilled. Follow proper procedure for clean up.

3. Be aware of first aid kit, fire extinguishers, alarm and hose locations. Check routinely to make sure they are working properly. Follow good housekeeping practices to reduce the risk of fires.

4. Material handling equipment (forklifts, cranes, etc.) shall be operated in a safe manner, as established in applicable training programs and manufacturer’s guideline. Pedestrians should be alert for moving equipment within and adjacent to shops.

5. Proper lifting techniques shall be used. Get help or use lifting equipment if necessary.

6. Be aware of loose or slippery materials, tripping hazards and other obstructions. Take appropriate measures to eliminate these conditions.

7. Determine routing for electrical cords and equipment lines to avoid tripping hazards.

8. Ensure adequate ventilation.

9. Ensure ready access to and operating conditions of eye washers and emergency showers in case of exposure to skin and eye irritants.

Related SOP’s

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Mechanic Operations – SOP 11A-22

SAFE OPERATING PROCEDURES

Mechanic Operations

Hazard Review

- Cuts, Bruises and Blisters
- Flying Metal Particles
- Pinching and Crushing Injuries
- Lifting
- Eye Injury

Required Personal Protective Equipment (PPE)

- Safety Shoes
- Safety Glasses/Goggles/Face Shield
- Hearing Protection

1. Make sure work area is clean and clear of all hazards.
2. Clean up spills as soon as they happen.
3. Use and keep in good shape all applicable safety equipment.
4. Use caution when moving equipment into or out of a shop. Use a spotter when necessary.
5. Locate such items as fire extinguishers and eyewash stations so you can find them in the event of an emergency.
6. Use lock-out tag-out on equipment that is not to be started or moved.
7. Always use the proper tools for the job. See your supervisor for any special tools.
8. Inspect drop cords routinely. See your supervisor for repair or replacement if needed.
9. Always use approved chains or slings and inspect before use.
10. Make sure hoist is in good operating condition. Report any defects to your supervisor or safety officer.
11. Use extreme caution when working around cranes. Use proper hand signals so you can communicate with the operator.
12. Do not get under any object being lifted by crane or hoist.
13. Do not charge batteries within 18” of floor.
14. Always inspect the area around you to make sure you have a clear path so you can get out of the way in an emergency.
15. Never get under any equipment supported only by a jack. Always use the proper stands.
16. Make sure the full weight is resting on the stand and the equipment is secure.
17. Use only jacks that are in good condition and proper tonnage for your application. Report any defective jack or stands to your supervisor. Do not use them.
18. No smoking in shop or while repairing equipment.

Related SOP’s

- General SOPs ............................ Chapter 10
- Equipment/Automotive Painting .......... 11A-5
- Hydraulic System Repairs .................. 11A-11
- Metal Cleaning, Chem./High Press. Wash 11A-23
- Metal Punching, Forming and Shearing 11A-25
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- Welding, Arc .................................. 11A-39
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- Maintenance and Repair Shops (General) 11A-21
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SAFE OPERATING PROCEDURES

Metal Cleaning, Chemical/High Pressure Wash

Hazard Review

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<td>Gloves</td>
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</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Ensure ready access to and operating conditions of eye washers and emergency showers in case of exposure to cleaning materials.
3. Determine safe routing of hoses to prevent tripping hazards and unnecessary exposure to ruptured hoses or leaking fittings.
5. Ensure fire hazards are minimized when using volatile hydrocarbon degreasers. Know the location of and ensure access to fire fighting equipment.
6. Ensure adequate ventilation when cleaning vats are within buildings.
7. Proper lifting techniques shall be used. Get help or use lifting/handling equipment if necessary.
8. Be aware of loose or slippery materials, tripping hazards and other obstructions. Take appropriate measures to eliminate these conditions.
9. Ensure adequate rinsing or aid drying of cleaned material prior to unprotected handling.
10. Hazardous wastes and cleaning chemicals are to be stored and disposed of only in accordance with approved procedures.

Related SOP’s

General SOPs .................................................Chapter 10  Hazardous Waste Handling and Storage....... 11E-5
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SAFE OPERATING PROCEDURES

Metal Cleaning, Mechanical/Abrasive

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<td>Cuts and Abrasions</td>
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<tr>
<td>Pressurized Hoses</td>
<td>Electrical Shock</td>
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</tbody>
</table>

Required Personal Protective Equipment (PPE)

| Safety Goggles/Face Shield    | Safety Shoes                          | Protective Clothing            |
| Hearing Protection            | Respirator                             | Gloves                         |
| Hard Hat                      |                                       |                                |

1. Be familiar with first aid kits, fire extinguishers in the work area and check regularly for proper operations.
2. Review Safe Operating Procedures for hand tools-chippers and grinders.
3. Route for electrical cords or airlines to prevent tripping hazards.
4. Shield work area or exclude unprotected personnel from high velocity flying debris.
5. Hazardous wastes and cleaning chemicals are to be stored and disposed of only in accordance with approved procedures.
6. Ensure that adequate ventilation is provided when working in confined spaces.
7. Ensure that work area is free of combustible materials, liquids and gases.
8. Review MSDS's for all chemicals used.

Related SOP’s

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Metal Cleaning, Mechanical/Abrasive– SOP 11A-24
SAFE OPERATING PROCEDURES

Metal Punching, Forming and Shearing  
SOP 11A-25

Hazard Review

Pinching and Crushing Injuries  
Eye Injuries  
Cuts, Scrapes and Bruises  
Lifting

Required Personal Protective Equipment (PPE)

Safety Shoes  
Safety Glasses/Face Shield  
Gloves  
Hearing Protection  
Protective Clothing

1. OSHA regulations related to punching, forming and shearing equipment are specific and stringent; be certain that applicable rules have been explained and are fully understood.
2. Never operate a machine without proper guarding in place and functioning.
3. Eye protection is required by any personnel in proximity of punching, shearing or bending operations as defined by yellow aisle markings.
4. Never operate a power actuated punch, shear or bending machine until you have received instructions on the specific machine to be used and its safety devices.
5. Check punches, dies, rams, hold-downs and strippers (when applicable) for proper adjustment, alignment and proper, secure mounting prior to operation.
6. If two operators are used to feed material, agree on who will actuate the machine and a “ready” signal for each person.
7. Use proper lifting and handling techniques. When required use overhead cranes, forklifts or another person.
8. Be certain where scrap material or “bend-ups” will go and that this area is clear.
9. Do not wear loose fitting clothes or neckties.
10. Before beginning a job, ensure a neat orderly workspace with sufficient clearance for handling raw material, finished goods and scrap.
11. Review the MSDS for all chemicals used.

Related SOP’s

General SOPs ........................................ Chapter 10  
Hoisting/Jacking ........................................ 11A-9
Maintenance and Repair Shops (General) 11A-21  
Metal Removing by Machine .................. 11A-26
High Pressure Hoses .............................. 11E-6  
Rigging ................................................. 11E-9
Forklift ................................................. 12A-6
SAFE OPERATING PROCEDURES

Metal Removing by Machine
Drills, Mills, Lathes and Grinders of All Types

Hazard Review
Eye Injuries
Pinch Points
Electric Shock
Solvents
Slip, Trip and Fall

Required Personal Protective Equipment (PPE)
Safety Shoes
Gloves
Hearing Protection
Protective Clothing
Safety Glasses/Goggles/Face Shield

1. Never operate any metal removal machine until you have been fully instructed on the machine’s set-up, controls, safety devices and proper operation.
2. Never operate a machine in this category wearing loose fitting clothes, long sleeve shirts with cuffs either unbuttoned or not rolled up above the elbow, a necktie, rings or jewelry.
3. Safety glasses are required of any person in proximity of metal removing machinery as defined by the yellow aisle markings.
4. Never adjust a machine until the spindle has completely stopped.
5. Be certain that all guards and shields are in place and functioning.
6. Do not use a machine in any manner other than that intended by the manufacturer; do not overload a machine.
7. Proper lifting techniques shall be used. Get help or use equipment if necessary.
8. Maintain a neat, orderly work area; place all scrap in proper containers periodically to avoid dangerous build-ups around rotating machines or where they represent a tripping hazard.
9. Do not allow machines to continue running unattended. Do not carry on conversations with your back to a machine in operation.
10. When using hand tools to adjust or tighten machine parts or tools, be sure the spindle is completely stopped and that you have sound footing and good balance.
11. Be sure that cutting tools are sharp, properly adjusted and fully tightened before turning on the machine.
12. Review MSDSs for all chemicals used.

Related SOP’s
General SOPs .................................................Chapter 10 Hoisting/Jacking .............................................11A-9
Maintenance and Repair Shops (General) .11A-21 Mechanic Operations .............................................11A-22
Lockout/Tagout .............................................. 11E-8 Rigging ....................................................... 11E-9
Hand Tools (Power and Manual) ............... 12B-13
SAFE OPERATING PROCEDURES

Photogrammetry Laboratory SOP 11A-27

Hazard Review

Hazardous Chemicals Electric Shock Slip, Trip and Fall
Moving Machinery

Required Personal Protective Equipment (PPE)

Safety Glasses/Goggles Rubber Gloves Lab Apron
Safety Shoes Respirator

1. Be thoroughly familiar with the hazards of the chemicals used. Review applicable MSDS’s.
2. Avoid splashing and spilling chemicals. Wipe all spills immediately.
3. Wear protective clothing, such as lab apron eye protection and rubber gloves when handling chemicals.
4. Wear respirator when mixing and transferring chemicals.
5. If chemicals get into the eyes, immediately flush eyes with water for approximately 15 minutes.
6. If chemicals come in contact with the skin, immediately wash with water.
7. Always dispose of chemicals properly. Do not mix with other chemicals.
8. Observe all warnings and cautions as noted on equipment.
9. Do not defeat or bypass built in equipment safety features.
10. Disconnect electrical power before servicing when possible.
11. For equipment with separate electrical switch boxes, use lockout/tagout methods.
12. If electrical power must be applied for servicing or trouble shooting, use caution to prevent injury.
13. Keep hands, fingers and tools clear of moving parts.
14. Do not wear loose-fitting clothing or jewelry while performing maintenance on equipment.
15. Store all cables and tubing properly to eliminate tripping hazards.

Related SOP’s

General SOPs.................................................Chapter 10 Hazardous Waste Handling and Storage........... 11E-5
SAFE OPERATING PROCEDURES

Pipefitting, Shop/Vessel

Hazard Review

Noise Hazardous Materials Explosive Atmospheres
Confined Spaces Poor Visibility Lifting
Temperature Extremes Pressurized Systems Oxygen Deficient Atmospheres

Required Personal Protective Equipment (PPE)

Safety Shoes Safety Glasses Hearing Protection
Gloves

1. Confined spaces must be well ventilated prior to entry and checked by a certified competent person. Never enter a confined space without a standby observer.

2. Be aware of the safety precautions regarding handling of hazardous materials. Ensure MSD units are pumped out, flushed and well ventilated prior to work. A “Certified Competent Person” must test the affected space for hydrogen sulfide and explosive vapors.

3. Electrical equipment, including lighting, pumps, switches, power tools and automatic starting machinery, should be checked for defects. Use Lockout/Tagout procedures as appropriate.

4. Be aware of fire extinguishers, alarm and hose locations. Check routinely to make sure they are working properly. Follow good housekeeping practices to reduce the risk of fires.

5. Know the causes and symptoms of heat stress and respond accordingly.

6. Check pressurized piping, hoses, tanks, steering systems, etc., for unsafe conditions prior to work. De-energize, de-pressurize and/or exercise systems prior to repair. If in doubt, consult supervisor.

7. Ensure chain hoist, lifting devices and other rigging equipment are in good operating condition prior to use. Return defective equipment for repair.

8. Read and comply with Facility Safety Manual and other pertinent instructions.

9. Read product labels, the MSDS and manufacturers labels before handling chemicals. Hazardous materials should be properly stored and must be in accordance with manufacturers’ guidelines.

10. Be aware of loose or slippery materials, tripping hazards and other obstructions. Take appropriate measures to eliminate them.

11. Proper lifting techniques shall be used. Get help or use equipment if necessary.

12. Use appropriate supplemental lighting when working in dark, poorly lighted and/or limited workspaces.

13. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.

Related SOP’s

General SOPs…………………………..Chapter 10 Welding, Oxy-Acetylene Cutting ………...11A-40
Welding, Arc……………………………………11A-39 Confined Space Entry ………………………. 11E-1
High Pressure Hoses …………………….11E-6 Lockout/Tagout……………………………………. 11E-8
Rigging………………………………………..11E-9 Hand Tools (Power and Manual)……….……….12B-13
SAFE OPERATING PROCEDURES

Plumbing Operations SOP 11A-29

Hazard Review

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<tr>
<td>Moving Equipment</td>
<td>Safety Shoes</td>
<td>Safety Glasses/Goggles</td>
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</table>

Required Personal Protective Equipment (PPE)

- Safety Shoes
- Gloves
- Safety Vest
- Safety Glasses/Goggles

1. Ensure use of proper equipment and procedures in excavating and shoring of ditches.
2. Use proper techniques in lifting pipes; use equipment or more help if needed.
3. Use correct tools and equipment designed for the job.
4. Use extreme caution and ensure clear work area.
5. Ensure required protective equipment is in working order and accessible at the job site.
6. Evaluate site and follow Excavation, Trenching and Shoring Standards.
7. Use extreme caution in the removal of streamlines. Discharge all pressure and drain lines before opening.
8. Safety glasses must be worn during any soldering, cutting or threading operation.
9. Establish eye contact with operator before approaching equipment.
10. Determine traffic control needs from Work Zone Safety Handbook.

Related SOP’s

- General SOPs: Chapter 10
- Excavating, Trenching and Shoring: 11E-3
- Rigging: 11E-9
- Confined Space Entry: 11E-1
- High Pressure Hoses: 11E-6
SAFE OPERATING PROCEDURES

Print Shop Activities

REQUIRED PERSONAL PROTECTIVE EQUIPMENT (PPE)

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<td>Shop Apron</td>
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1. Switch machines off when clearing paper jams or straightening paper in machines. When servicing, cleaning or setting up machine, use lockout/tagout procedures.
2. Make sure all safety covers and guards are in place.
3. Do not turn hand wheels with finger on perforating blades.
4. Do not leave operating machine unattended.
5. Keep loose-fitting clothes away from rollers and gears.
6. Keep hands and fingers clear of heating wire and machinery.
7. Only one person at a time should operate paper cutter.
8. Use two hands to operate paper cutter.
9. Dispose of oily or cleaning rags in an OSHA-approved metal container secured by a metal lid.
10. Store flammable materials in an OSHA-approved fire safety cabinet.
11. Store corrosive materials separate and apart from flammable materials.
12. Do not stack cases more than four (36”) high.
13. Review applicable MSDS for chemicals used.

Related SOP’s

General SOPs...................................................... Chapter 10
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SAFE OPERATING PROCEDURES

Sandblasting

Hazard Review

- Flying Particles
- Dust
- Hazardous Material
- Lifting
- Moving Traffic
- Pressurized Fluids

Required Personal Protective Equipment (PPE)

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<tr>
<td>Safety Shoes</td>
<td>Safety Glasses</td>
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Sand Reservoir and Hose Assembly

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Check all fittings for leaks and alignments.
3. Muffler should be attached to compressor to reduce blowback noise.
4. Check position of all valves before activating blaster. Nozzle should have a “Dead Man” shutoff valve.
5. Drain water from the separator.
6. Stand clear and do not face sand reservoir after filling. Be careful not to overfill and never try to remove debris from the top of the hopper by hand, while the lines are still pressurized.
7. Keep unauthorized personnel out of immediate sandblast area.
8. Check blasting hoses for rips, tears and soft spots. Do not use defective or blocked hoses.
9. Check nozzle shutoff mechanism prior to use and check nozzle for wear, and make sure all safety latches and pins are in place.
10. Do not allow vehicles to run over hoses. Avoid kinks and sharp turns in hoses.
11. Avoid dragging hoses over concrete or any surface that could induce wear.
12. Never point an operational sand blasting hose toward personnel or equipment.

Sandblasting Hood

13. Adjust helmet headband and chinstrap to proper size. Clean and disinfect hood before and after use.
14. Make sure hood-skirting is fitted down over shoulder and snaps are fastened.
15. The waist belt for the air hose should be worn outside of skirting to allow easy adjustment.
16. Check the air supply system (including connections and kinks in the air supply line to the hood).
17. Long sleeve shirts, safety glasses, safety shoes and hearing protection are required.
18. A positive pressure air hood is required. The supplied air must be at least Grade D breathable air.
   Grade D air has the following characteristics:
   - Oxygen content from 19.5 to 23.5 percent
- Condenses oil at 5 mg/m³
- Carbon monoxide (CO) not to exceed 10 parts per million (PPM)
- Carbon dioxide (CO₂) not to exceed 100 PPM
- No odor
- If a fresh air pump is being used to supply air to the hood, air intake on the pump must be a minimum of fifty feet away from any running piston driven engine.

Hazardous Material Note

When red lead is encountered or is suspected in removal operation, stop immediately and consult supervisor.

Related SOP’s

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SAFE OPERATING PROCEDURES

Service Station Operation

Hazard Review
Explosions
Smoking
Spills or Fuel Leaks
Moving Vehicles and Equipment
Remove Hose From Vehicles

Required Personal Protective Equipment (PPE)
Safety Shoes

1. Drive up to the dispensers with filler cap adjacent to dispenser and leave enough room to get fuel safely. Do not drive over hose.
2. Turn off engine.
3. Extinguish all smoking material before dispensing fuel.
4. Lower risk of static spark by touching bare hand to metal part of vehicle after exiting and before beginning fueling process.
5. Stay with dispenser until tank is filled.
6. Place fuel in properly labeled containers. Place containers on ground before fueling.
7. Return dispensing hose to its proper rest.
8. Watch for other traffic; do not back away from island.
9. Check for clearance and traffic in all directions before moving away from island.
10. Fire extinguishers should be prominently displayed and routinely checked for sufficient charge.
11. Warning decals and symbols should be displayed on each dispenser.
12. Use specifically designed oil absorption materials to clean up spills. Do not rinse and wash away.

Related SOP’s
General SOPs...............................................Chapter 10  Hazardous Waste Handling and Storage........... 11E-5
Lockout/Tagout............................................ 11E-8  Truck, Fuel and Lube....................................... 12A-32
SAFE OPERATING PROCEDURES

Sewing and Upholstery

SOP 11A-33

Hazard Review

| Sharp-Pointed Tools | Chemical Solvents | Cuts and Pinch Points |
| Eye Injuries        | Puncture Wounds   | Slip, Trip and Fall  |

Required Personal Protective Equipment (PPE)

| Safety Shoes | Safety Glasses |

1. Safety glasses are required for all operations.
2. Never re-thread a sewing machine or replace a bobbin with power switch on.
3. Assure all covers and guards are in place and functioning.
4. Review MSDS before using glues, solvents or epoxies.
5. Be aware of excess material and yard goods that can create a tripping hazard; maintain a neat orderly work place, free of cuttings and trimmings.

Related SOP’s

General SOPs ..........................................Chapter 10
Hand Tools (Power and Manual) ............... 12B-13
Maintenance and Repair Shops (General) ....11A-21
**CNAME**: Shipyard Painting – SOP 11A-34

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## SAFE OPERATING PROCEDURES

### Shipyard Painting

#### SOP 11A-34

#### Hazard Review

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<td>Airless Sprayers</td>
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#### Required Personal Protective Equipment (PPE)

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1. Each employee shall be fit tested and instructed on the use and care of respirators. Proper protective equipment shall be worn to protect against contaminants.
2. Read product labels, MSDSs and manufacturers labels before handling chemicals. Hazardous materials should be properly stored and must be in accordance with manufacturers’ guidelines.
3. Be aware of loose or slippery materials, tripping hazards and other obstructions. Take appropriate measures to eliminate them.
4. Confined spaces must be well ventilated prior to entry and checked by a certified competent person. Never enter a confined space without a standby observer.
5. Painting involves the use of high-pressure hoses, which shall be inspected for defects before each use and replaced as necessary.
6. Always keep the tips of airless sprayers away from yourself or others since they can cause the injection of chemicals into the skin or eyes.
7. Accessory equipment (Man lifts, Scissors lifts, etc.) shall be operated in a safe manner as established in applicable training programs and manufacturer’s guidelines.
8. Use flashlights or appropriate supplemental lighting when working in dark, poorly lighted and/or limited workspaces.

#### Related SOP’s

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Tire Repair/Inflation

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**Required Personal Protective Equipment (PPE)** *(Based on job specific hazard review)*

- Safety Shoes
- Hearing Protection
- Gloves
- Safety Glasses

**General Requirements**

1. Follow all manufacturers’ guidelines.
2. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
3. The employee must not service any rim or wheel unless the employee has been instructed in correct procedures of mounting, demounting, and servicing activities such as tire inflation for tires, rims, and the safe operating precautions for the type of wheel being serviced.
4. The employee must wear eye and foot protection.
5. All hand tools, equipment, and jacks should be thoroughly inspected before performing this type of work activity (looking for damage or defects).
6. The following equipment and precautions **MUST** be taken when performing this operation on both single piece and multi-piece wheel rims:
   a. A spring-loaded clip-on air chuck is recommended to be used. Other types of clip-on air chuck may be used.
   b. A minimum of 6 feet of hose shall be between the air chuck and an in-line inflation valve and gauge.
   c. The employee must stand to one side of the tire being inflated and out of the ‘trajectory path’ of the wheel rim and components.
   d. The amount of air added to the tire **MUST** be carefully monitored to prevent an over-inflation condition.
   e. Immediately stop the inflation process if any noises are heard coming from the tire or rim wheel that is being inflated.
7. Tires shall be completely deflated before dismounting from vehicle by removal of the valve core on both single piece and multi-piece wheel rims.
8. Cracked, broken, bent, or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated.
9. No heat shall be applied to a multi-piece wheel or wheel component.
10. Stored mounted tires should not exceed 20 PSI.
11. For additional information, consult the following: Hand and Power Tools, OSHA 3080; OSHA Reg. 1910.177; National Rim & Wheel W-770; OSHA Pamphlet 3086; OSHA Rim Wheel Characteristics.
**Multi-Piece Rim Wheel Safety Procedures**

1. Tires shall be completely deflated by removing the valve core before a rim wheel is removed from the axle in either of the following situations:
   - When the tire has been driven underinflated at 80% or less of its recommended pressure, or
   - When there is obvious or suspected damage to the tire or wheel components.

2. Nonflammable rubber lubricant shall be applied to bead and rim mating surfaces during assembly of the wheel and inflation of the tire, unless the tire or wheel manufacturer recommends against it.

3. If a tire on a vehicle is underinflated but has more than 80% of the recommended pressure, the tire may be inflated while the rim wheel is on the vehicle provided remote control inflation equipment is used, and no employees remain in the trajectory during inflation.

4. Tires shall be inflated outside a restraining device only to a pressure sufficient to force the tire bead onto the rim ledge and create an airtight seal with the tire and bead (not to exceed 10 psi).

5. Tires must be placed in a restraining device for further inflation.

6. Whenever a rim wheel is in a restraining device, the employee shall not rest or lean any part of his body or equipment on or against the restraining device.

7. After tire inflation, the tire and wheel components shall be inspected while still within the restraining device to make sure that they are properly seated and locked. If further adjustment to the tire or wheel components is necessary, the tire shall be deflated by removal of the valve core before the adjustment is made. To remove the tire from the restraining device, the tire should be deflated to 20 PSI before removal. If tire is to be balanced and mounted on vehicle, the tire should not be deflated.

8. No attempt shall be made to correct the seating of side and lock rings by hammering, striking or forcing the components while the tire is pressurized.

9. Whenever multi-piece rim wheels are being handled, employees shall stay out of the trajectory unless the employer can demonstrate that performance of the servicing makes the employee’s presence in the trajectory necessary.

10. Fully inflated, multi-piece wheels must not be transported except in a restraining device.

**Single Piece Rim Wheel Safety Procedures**

1. Mounting and demounting of the tire shall be done only from the narrow ledge side of the wheel. Care shall be taken to avoid damaging the tire beads while mounting tires on wheels. Tires shall be mounted only on compatible wheels of matching bead diameter and width.

2. Nonflammable rubber lubricant shall be applied to bead and wheel mating surfaces before assembly of the rim wheel, unless the tire or wheel manufacturer recommends against the use of any rubber lubricant.

3. If a tire changing machine is used, the tire shall be inflated only to the minimum pressure necessary to force the tire bead onto the rim ledge while on the tire changing machine.

4. If a bead expander is used, it shall be removed before the valve core is installed and as soon as the rim wheel becomes airtight (the tire bead slips onto the bead seat).

5. Tires may be inflated only when contained within a restraining device, positioned behind a barrier, or bolted on the vehicle with the lug nuts fully tightened.
6. Tires shall not be inflated when any flat, solid surface is in the trajectory and within one foot of the sidewall.
7. Employees shall stay out of the trajectory when inflating a tire.
8. Tires shall not be inflated to more than the inflation pressure stamped in the sidewall. In addition, employees shall consult the manufacturers’ recommended tire size, rating, and pressure before inflating or changing tires.
9. Tires shall not be inflated above the maximum pressure recommended by the manufacturer to seat the tire bead firmly against the rim flange.

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SAFE OPERATING PROCEDURES

Traffic Services’ Shops and Warehouses

Hazard Review
- Slip, Trip and Fall
- Lifting
- Sharp Tools
- Sharp Edges, Burrs
- Hot Surfaces
- Electrical Shock

Required Personal Protective Equipment (PPE)
- Safety Shoes
- Safety Glasses
- Gloves
- Safety Glasses/Goggles

1. Gloves should be used when handling hot materials and materials or tools with sharp edges or burns. Eye protection is important when task creates flying chips, burrs, etc.
2. Proper lifting techniques shall be used. Get help or use equipment if necessary.
3. Be aware of loose material, tripping hazards and other obstructions. Good housekeeping is important to eliminate slips, trips and falls.
4. Do not touch any wiring with which you are unfamiliar because of danger of electrical shock.
5. Spilled glass beads should be removed promptly to eliminate slippery surface.
6. All sign shop painting and screening shall be conducted in a well-ventilated area, using exhaust fans and filters.

Related SOP’s
- General SOPs .................................................Chapter 10
- Electrical Installation/Repairs ..........................11A-4
- Metal Punching, Forming and Shearing ....11A-25
- Warehouse ..........................................................11A-38
SAFE OPERATING PROCEDURES

Trichloroethane Still SOP 11A-37

Hazard Review

Hazardous Chemicals Noxious Vapors

Required Personal Protective Equipment (PPE)

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1. No employee may operate the still until he has received thorough training on the procedures for operating a still.
2. Each still operator shall review the Material Safety Data Sheets (MSDS) before starting work.
3. Employees should inspect the still and related equipment to ensure it is in good condition before each work shift.
4. Each still operator must obtain and wear the proper personal protective equipment such as face shield, safety goggles, gloves, rubber aprons, etc.
5. Each still operator must ensure that adequate ventilation (mechanical or natural) is properly operating before beginning work.
6. Each still operator shall follow proper lifting procedures or use mechanical devices whenever trico cans must be moved or poured.
7. Still operators shall never leave a still unattended while distillation is in progress.
8. Each still operator should thoroughly review the work area before beginning operation to ensure that safety response items (eye wash bottle or shower), spill control materials, and other items for emergency response are readily available and accessible.
9. Still operators must report all spills to their supervisor as soon as possible after containing the leakage.

Related SOP’s

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SAFE OPERATING PROCEDURES

Warehouse SOP 11A-38

Hazard Review

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Required Personal Protective Equipment (PPE)

| Safety Shoes | Safety Glasses | Gloves |

1. Steel-toe shoes are required.
2. Be aware of the wide variety of chemicals, cleaning agents, degreasers, paints, thinners and other combustible materials stored in the warehouse. Read and follow warning labels on containers and on the MSDS, ensuring materials are handled and stored properly.
3. Be familiar with the Facility Contingency Plan. Notify the supervisor if a hazardous substance is spilled. Follow proper procedure for clean up.
4. Be aware of fire extinguishers, alarm and hose locations. Check routinely to make sure they are working properly. Follow good housekeeping practices to reduce the risk of fires.
5. Material handling equipment (forklifts, pallet truck, etc.) shall be operated in a safe manner, as established in applicable training programs and manufacturer’s guidelines. Pedestrians should be alert for moving forklifts when approaching blind corners.
6. Material shall be stacked properly for safe and efficient retrieval. Keep heavier materials near floor. Stack items so that they do not extend into aisles. Be sure bin items do not extend into walkways and that bin drawers are not left open.
7. Be alert for materials, which may have been stored improperly.
8. Proper lifting techniques shall be used. Get help or use lifting equipment if necessary.
9. Be aware of loose or slippery materials, tripping hazards and other obstructions. Take appropriate measures to eliminate them.
10. If ladder is used, follow standard operating procedures and manufacturer’s recommendations.
11. Label all fire exits.

Related SOP’s

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SAFE OPERATING PROCEDURES

Welding, Arc  SOP 11A-39

Hazard Review

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20. For additional information consult the following: AWS Specifications & Safe Practice Codes.

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**Welding, Oxy-Acetylene Cutting**

**SOP 11A-40**

### Hazard Review

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1. Do not attempt to use oxy-acetylene cutting equipment until properly trained.
2. Avoid exposing cylinder to excess heat.
3. Check work area for flammable materials and keep fire extinguisher nearby.
4. The employee must wear eye and foot protection.
5. Never use oxygen as substitute for compressed air or feed into confined space.
6. Keep an adequate space between your work and the cylinders.
7. Acetylene should never be used above 15 PSI.
8. Use a striker to light the torch, not matches or lighters. Do not re-light the torch from hot metal.
9. Use correct pressures and tip sizes.
10. Never wrap hose or hang torch around cylinder valves or regulators.
11. Hoses should have check valves in correct position.
12. Have good ventilation while cutting. Respiratory equipment may be required.
13. Never cut or weld on any container that has held flammable substance without consulting AWS publication A6.0-65.
14. Keep hoses away from sparks, hot metal, sharp surfaces, and from being run over by heavy equipment.
15. Always stand to one side of any oxy-acetylene outfit when turning on the cylinders.
16. Never move a cylinder by dragging, sliding, or rolling.
17. Keep protective cap in place and avoid striking it against something that could cause a spark.
18. Identify oxygen and acetylene tanks by labeling, not by color code alone.
21. Do not allow cylinders to lie in horizontal position.
22. Do not pick up cylinders using the valve protector cap.
23. Acetylene valve should not be opened more than one half turn. Oxygen valve should be fully opened when in use.
24. If the cylinder valves leak or function improperly, do not attempt to repair. Contact the supplier.
25. Cylinders shall be properly secured to prevent them from being knocked over.
26. Cylinders shall not be transported with gauges attached.
27. Release pressure on regulators when work is finished.
28. Light the acetylene gas before opening the oxygen valve.

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SAFE OPERATING PROCEDURES

Wood Working

Hazard Review

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1. Know and regularly review Safe Operating Procedures of each piece of equipment.
2. Make sure work areas are clear and safe for work to be done.
3. Wear safety shoes, eye and ear protection.
4. Make sure depth and thickness levels are properly set.
5. See that blades and knives are sharp and working properly.
6. Make sure all work surfaces are clear of scraps and obstructions.
7. Never operate equipment until guards are in place and operating properly.
8. Be aware of others around so that nothing is thrown from a saw, which may cause injury.
9. Make sure on and off switches are in proper working condition.
10. Keep hands and clothing away from cutting surface.
11. Never adjust settings on machinery until switch is off and blades have ceased to rotate.
12. Safety glasses are required inside the yellow lines of the shop.
13. Use safe lifting practices.
14. Do not wear rings, ties or loose fitting clothing when operating machinery.
15. Use respirators when needed.
16. Do not use any equipment or perform any operation until fully trained and certified by the supervisor.

Related SOP’s

General SOPs.................................Chapter 10  Hand Tools (Power and Manual).......................12B-13
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SAFE OPERATING PROCEDURES

Aerial Photography SOP 11B-1

Hazard Review
Lifting

Required Personal Protective Equipment (PPE)
Safety Shoes

Ground Activities

1. Do not lift the aerial camera system without the aid of a mechanical lift.
2. Use extreme caution when installing/removing the camera system in the aircraft.
3. For operations requiring the use of interchangeable lens cones always obtain additional employees for removal of the drive unit and appropriate lens cone.
4. Use proper lifting techniques and support devices when moving camera systems.

In-flight Activities

1. Secure all equipment (film cassettes, tool kits, etc.) before flight to prevent injury during turbulent conditions.
2. When shooting aerial photography in high-density traffic areas, one intercom system should be used between the pilot and the photographer; a separate intercom should be used for communication between the co-pilot and the air traffic controller.
3. Changing aerial camera lens cones must take place while the aircraft is on the ground. Under no circumstances should the lens cones be changed while in flight.
4. Aircrew members suffering from head colds or other upper respiratory ailments should not fly in non-pressurized aircraft operating at multiple altitudes until the symptoms have dissipated.

Related SOP’s
General SOPs.................................................Chapter 10
SAFE OPERATING PROCEDURES

Asphalt Field Laboratory

SOP 11B-2

Hazard Review

Lifting Overhead Loads Hazardous Chemicals
Slip, Trip and Fall Moving Equipment

Required Personal Protective Equipment (PPE)

Safety Shoes Hearing Protection Safety Glasses/Goggles
Hard Hat Gloves Safety Glasses

1. Park in areas that provide safe entrances and exits for the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
2. Gloves and eye protection are recommended. Plant sites are generally designated “Hard Hat Areas”, requiring hard hats outside of buildings and equipment. Hard hats should always be worn when obtaining samples and inspecting plant.
3. Avoid walking and working under suspended loads.
4. Be aware of moving equipment on plant site. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
5. Proper lifting techniques shall be used.
7. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
8. Review the MSDS for 1,1,1 Trichloroethane, AC and aggregates.
9. Be sure that an eye wash bottle is readily available and accessible before beginning work.
10. Be sure ventilation equipment is operating during trichloroethane use. Be sure trichloroethane containers are properly sealed when not in use and stored.

Related SOP’s

General SOPs .............................................. Chapter 10 Trichloroethane Still ................................. 11A-37
Roadway Inspection ................................. 11B-69 Sampling and Inspection at ..................... 11B-71
Hazardous Waste Handling and Storage ...... 11E-5 Producer’s Facility
SAFE OPERATING PROCEDURES

Asphalt Overlays/Widening

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1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
6. Keep fire extinguishers available at all times when using a fired kettle.
7. Use caution when handling hot/flammable materials. Review the MSDS for each material used.
8. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
9. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
10. Allow ample space for each employee to work safely.
11. Before backing, make sure area is clear and use an observer when available.
12. Observe and stay clear of overhead utility lines.
13. Watch for flying sand and rock from sweeping operation and adjacent traffic.

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SAFE OPERATING PROCEDURES

Asphalt Pavement Maintenance SOP 11B-4

Hazard Review

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

<table>
<thead>
<tr>
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<th>Safety Glasses</th>
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<tr>
<td>Class 3 Safety Vest for Night Work</td>
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</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks. Know the locations of fire extinguishers on equipment.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Know your escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot or work from the shoulder of the road as much as possible.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment. Do not stand between moving pieces of equipment. Stay within the driver’s line of sight in the mirrors or keep clear of the equipment.
6. Keep fire extinguishers available at all times when using a fired kettle. Extinguisher should be on other equipment, not kettle. Fire extinguishers should have a visible and clear sight glass with no signs of rust on the fire extinguisher.
7. Use caution when handling hot/flammable materials. Review the SDS for each material used.
8. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures. Drink plenty of water while working when temperatures are hot and apply sunscreen.
9. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions that may be on the shoulders of the road or paved surface.
10. Allow ample space for each employee to work safely.
11. Use proper lifting and handling techniques while shoveling asphalt.
12. Before backing, make sure area is clear and use an observer when available.
13. Observe and stay clear of utility lines.
14. Use extra precautions when mounting and dismounting trucks to cover and uncover loads and to dispense material.
15. Be aware of flying debris from power broom, moving traffic, jack hammers, saws, picks, etc.
16. Be aware of dogs, domestic pets, snakes and other wildlife that maybe close to your work area.
17. For night work, Class 3 safety vests should be worn and work lights should be used.

**Related SOP’s**

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Asphalt Plant Operations

Hazard Review

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Required Personal Protective Equipment (PPE)

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<th>Safety Shoes</th>
<th>Hearing Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Glasses</td>
<td>Hard Hat</td>
<td>Gloves</td>
</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks before arriving at the asphalt plant site.
2. The asphalt plant site is a hard hat area. Hard hats shall be worn at all times while on the asphalt plant site.
3. Upon arriving at the asphalt plant site, spray dump truck bed with water or other protectant liquid.
4. Upon arriving at the asphalt plant, communicate with the asphalt plant operator on:
   - The amount of asphalt (the size of the load) that is to be received
   - The number of asphalt drops from the asphalt plant mixer box for your load
   - The amount of time (in seconds) between asphalt drops.
   - What methods are being used to communicate that the last drop is completed (e.g. traffic signals, horns, instructional signs, flashing lights, hand signals, eye contact, etc.)
5. Prior to pulling the dump truck under the asphalt plant mixer box, wait for a signal from the asphalt plant operator.
6. Pull receiving dump truck under the asphalt plant mixer box and position the dump truck bed directly under the asphalt plant mixer box. If more than one asphalt drop is to be dumped into the receiving dump truck bed, the dump truck operator may reposition the dump truck bed after each dump to evenly distribute the asphalt product in the truck bed.
7. If the dump truck cannot pull underneath the asphalt plant mixer box due to its height, the dump truck may be backed underneath the asphalt plant mixer box.
8. Before backing, make sure area is clear and use an observer when available.
9. While asphalt is being dumped from the asphalt plant mixer box into the dump truck bed, the dump truck operator shall remain inside the dump truck cab. Only between asphalt drops may the dump truck operator inspect the asphalt product in the truck bed.
10. Once the last asphalt drop is made into the dump truck bed, proceed slowly from underneath the asphalt plant mixer box.
11. Once the dump truck is completely from underneath the asphalt plant mixer box, check the asphalt load and cover as applicable to minimize asphalt particles and debris flying off the dump truck bed during travel to the project site.
12. Use extra precautions when mounting and dismounting trucks to cover and uncover loads and to dispense material.
13. Use caution when handling hot/flammable materials. Review MSDS as applicable.
14. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
15. Use proper lifting and handling techniques while shoveling asphalt.

**Related SOP’s**

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Asphalt Plant Operations – SOP 11B-5
SAFE OPERATING PROCEDURES

Bituminous Surface Treatment

Hazard Review

- Moving Traffic
- Flying Particles
- Temperature Extremes
- Hot/Flammable Materials
- Slip, Trip and Fall
- Overcrowding of Workers
- Utility Lines
- Moving Equipment

Required Personal Protective Equipment (PPE)

- Safety Vest
- Safety Shoes
- Hearing Protection
- Safety Glasses
- Gloves

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
6. Keep fire extinguishers available at all times when using a fired kettle.
7. Use caution when handling hot/flammable materials. Review the MSDS for each material used.
8. Take extra precautions to prevent heat stress when working in extremely hot temperatures.
9. Be aware of loose materials, excavation drop-off, tripping hazards, uneven ground and other obstructions.
10. Allow ample space for each employee to work safely.
11. Before backing, make sure area is clear and use an observer when available.
12. Observe and stay clear of overhead utility lines.
13. Watch for flying sand and rock from sweeping operation and adjacent traffic.
14. Use proper lifting and handling techniques while shoveling stone.

Related SOP’s

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- Asphalt Distributor ...................................... 12A-1
- Loader, Front End ........................................ 12A-11
- Spreader, Aggregate ...................................... 12A-21
- Hand Tools (Power and Manual) ...................... 12B-13
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SAFE OPERATING PROCEDURES

Blast Monitoring SOP 11B-7

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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<th>Safety Glasses</th>
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</thead>
<tbody>
<tr>
<td>Hard Hat</td>
<td>Hearing Protection</td>
<td>Leather Gloves</td>
</tr>
</tbody>
</table>

1. Attend all blasting operation safety meetings and discuss expectations with the “Lead Blaster”.
2. Several Explosives Specialist may support blasting operations however; Only one Explosive Specialist will be designated Lead Blaster for each operation and is the single point supervisor of the entire blasting operation. The Lead Blaster will not be overridden by other supervisors in the performance of duties (i.e. Make the shot-when not safe, etc…). When the explosives are set it is too late to change the shot. All conflicts must be resolved. Assistance from Director, Safety and Risk Management (SRM) is available or by calling (866)361-1818 (24/7/365) or reporting issue to anyrisk.nc.gov.
3. Be aware that premature initiation of explosives is possible and exercise extreme caution in the vicinity of explosives.
4. Be aware of emergency escape routes. Were possible stand near a sheltered location, which may provide protection against fly rock.
5. Employees on foot use caution to stay clear of operation equipment. Always establish eye contact with the operator before approaching equipment,
6. Take care not to operate radio transmitting equipment in the vicinity of blast sites which are utilizing electric blasting caps.
7. Review signaling system between monitor and blaster prior to operation.
8. Place monitoring equipment a safe distance from blasting site to ensure safety of individual and to avoid equipment damage.
9. Any persons/employee associated the blasting operation/site may call “CEASE FIRE” at any time.
10. All persons (including Road Guards) are responsible for shot security shall be instructed as to their responsibilities, warning signals, and related information.

Related SOP’s

General SOPs ..............................................Chapter 10 Explosives .................................................11-E4

Blast Monitoring - SOP 11B-7
SAFE OPERATING PROCEDURES

Borrow Pit, Waste Pit and Stockpiling Operations

Hazard Review

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(Based on job specific hazard review)

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<th>Safety Glasses</th>
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<tbody>
<tr>
<td>Hard Hat</td>
<td>Hearing protection</td>
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</tr>
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</table>

1. Follow all manufacturers’ guidelines.
2. Review Safe Operating Procedures for applicable equipment and perform documented pre-operational checks.
4. Review all rules and requirements of the mine operator.
5. Review employee training records to meet MSHA guidelines.
6. Evaluate site and follow excavation, trenching and shoring standards that apply.
7. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
8. Employees on foot must use extreme caution to stay clear of operating equipment. Avoid areas behind operating equipment.
9. Avoid areas of the mine you are not required to enter.
10. Observe and stay clear of overhead utility lines.
11. Be aware of loose material, excavation drop-offs, steep slopes, uneven ground and other hazards and obstructions.
12. Before backing, make sure area is clear and use spotter.
13. Be aware of stockpile stability when removing material or when sampling. Do not leave vertical slopes in stockpiles that could collapse on a person on foot.
14. Drivers should stay in cab while on the mine site, unless otherwise required by mine operator.

Related SOPs

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Bridge Deck Cleaning

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<td>Respirable Crystalline Silica (RCS)</td>
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</tbody>
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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

<table>
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<tr>
<td>Class 3 Safety Vest for Night Work</td>
<td>Particulate respirator if RCS above PEL</td>
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</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Avoid walking and working under suspended loads.
5. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Allow ample space for each employee to work safely.
8. Locate all utilities in and near work site prior to commencing work.
9. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
10. Be alert to protruding nails or spikes in decks and rails.
11. Keep walk spaces and work areas free of loose materials or tools.
12. Observe Safe Operating Procedures for handling high-pressure hoses.
13. Unnecessary personnel shall stay away from work area.
14. Safety goggles should be worn by personnel that are in the immediate work area due to flying particles caused by high-pressure air or water.
15. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
16. Employees should wash hands before eating, drinking or smoking.
17. Review SDS’s for any cleaning chemicals being used.
18. High-pressure air hoses should have a “dead-man” shutoff valve.

19. Utilize traffic mounted attenuators, warning signs, and message boards for slow moving operations while picking up debris. Do not allow too much space between vehicles being loaded with debris and the TMA’s or Message Board trucks to prevent traffic from pulling back into the slow-moving operations.

20. Respiratory protection is required when the blower is operated by a specific employee for 4 or more hours or on 4 or more bridges. Respirators with an assigned protection factor (APF) of at least 10 must be used for this task per NCDOT Silica Exposure Control Plan.

### Related SOP’s

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Bridge Expansion Joint Maintenance SOP 11B-10

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**Required Personal Protective Equipment (PPE)**
*(Based on job specific hazard review)*

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<tr>
<td>Particulate respirator if RCS above PEL</td>
<td>Face Shield</td>
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1. Follow all manufacturers’ guidelines.
2. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
3. Implement Traffic Control Plan as specified in both NCDOT Standard Specifications and Drawings for Work Zone Traffic Control and MUTCD.
4. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
5. Use fall protection or install temporary rails if required.
6. Use proper lifting techniques. Get help or use equipment if necessary.
7. Be aware of loose materials, tripping hazards and other obstructions and keep free from walking working areas
8. Allow ample space for each employee to work safely.
9. Locate all utilities in and near work site prior to commencing work.
10. Be aware of protruding rebar that may pose a tripping, laceration, or impalement hazard.
11. Review SDS's for all hazardous materials being used or expected to encounter.
12. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
13. Employees should wash hands before eating, drinking or smoking. Do not clean hands or clothes with pressurized air.
14. Dispose of debris and salvage materials properly.
15. Watch for flying sand, dust or other debris when blowing out joints with compressed air. Eye protection must be worn. Be aware of wind direction and try to work upwind.
16. When cutting concrete, use concrete saw with integrated water delivery system to reduce RCS exposure below PEL.
17. If integrated water delivery system is not used, particulate respirator of assigned protection factor (APF) 10 or better must be used based on risk assessment.
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Bridge Handrail Maintenance  

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<tr>
<td>Particulate respirator if RCS above PEL</td>
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</table>

1. Follow all manufacturers’ guidelines.
2. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
3. Implement Traffic Control Plan as specified in both NCDOT Standard Specifications and Drawings for Work Zone Traffic Control and MUTCD.
4. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
5. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a personal fall arrest system comprised of a body harness, lanyard and life line.
6. Never walk or work under suspended loads.
7. Proper lifting techniques shall be used. Get help or use equipment if necessary.
8. Try to perform work while facing traffic.
10. Allow ample space for each employee to work safely.
11. Locate all utilities in and near work site prior to commencing work.
12. Be alert to poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high top boots to protect against these hazards.
13. Be alert to protruding nails or spikes in decks and rails.
14. Review SDS’s for all hazardous materials being used or expected to encounter.
15. Dispose of salvage materials properly, use gloves and long-sleeved shirts when handling treated timbers.
16. Be aware of pinch points and crushing hazards.
17. Take extra precaution to prevent heat and cold stress when working in extremely hot or cold temperatures.
18. Employees should wash hands before eating, drinking or smoking.
20. Take a water pressure fire extinguisher or couple buckets of water to grassy area under bridge where work is being done. If neither is available take an ABC fire extinguisher.
21. Observe Safe Operating Procedures for scaffolding if applicable.
22. When cutting concrete, use concrete saw with integrated water delivery system to reduce RCS exposure below PEL.
23. If integrated water delivery system is not used, particulate respirator of assigned protection factor (APF) 10 or better must be used based on risk assessment.

<table>
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<th>Related SOP’s</th>
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Bridge Jacking

Hazard Review

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Required Personal Protective Equipment (PPE)

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<th>Gloves</th>
<th>Safety Shoes</th>
<th>Safety Vest</th>
<th>Body Harness/Lanyard</th>
</tr>
</thead>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Know rated capacity of jacks to avoid overload.
4. Use stable base to position jacks.
5. Keep unnecessary personnel clear of loaded area when lifting or lowering.
6. When multiple jacks are used, lifting and lowering should be uniform.
7. The load shall be braced with blocks or with some other approved means before work commences.
8. Keep all objects clear that could cause lateral forces to be applied to the jack.
9. Be aware that jacks could “kick out” due to shifting loads. If jack starts to tilt while jacking, stop immediately, relieve load and reposition jack.
10. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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<tr>
<td>Particulate respirator if RCS above PEL</td>
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</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Implement Traffic Control Plan as specified in both NCDOT Standard Specifications and Drawings for Work Zone Traffic Control and MUTCD.
3. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Proper lifting techniques shall be used. Get help or use equipment if necessary.
5. Be aware of loose materials, tripping hazards and other obstructions.
6. Allow ample space for each employee to work safely.
7. Locate all utilities in and near work site prior to commencing work.
8. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high top boots when hazards can not be avoided.
9. Be alert to protruding nails, spikes or reinforcing bars in decks and rails.
10. Keep walk spaces and work areas free of loose materials or tools.
11. Review SDS's for all hazardous materials being used or expected to encounter.
12. Do not clean hands with pressurized air.
13. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
14. Employees should wash hands before eating, drinking or smoking.
15. Dispose of salvage materials properly.
16. Be aware of escape routes in case of emergency.
17. When cutting concrete, use concrete saw with integrated water delivery system to reduce RCS exposure below PEL.
18. If integrated water delivery system is not used, particulate respirator of assigned protection factor (APF) 10 or better must be used based on risk assessment.
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Concrete Bridge Super/Sub Structure Maintenance

Hazard Review

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<tr>
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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

<table>
<thead>
<tr>
<th>Hard Hat</th>
<th>Safety Vest</th>
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</thead>
<tbody>
<tr>
<td>Safety Glasses/Goggles</td>
<td>Fall Protection</td>
<td>Hearing Protection</td>
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</table>

| Particulate respirator if RCS above PEL | |

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Implement Traffic Control Plan as specified in both NCDOT Standard Specifications and Drawings for Work Zone Traffic Control and MUTCD.
3. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
5. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Be aware of loose materials, excavation drop-off, tripping hazards and other obstructions.
8. Allow ample space for each employee to work safely.
9. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.
10. Be alert to poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high top boots when hazards can not be avoided.
11. Be alert to protruding nails, spikes or reinforcing bars in decks and rails.
12. Keep walk spaces and work areas free of loose materials or tools.
13. Review SDS's for all hazardous materials being used or expected to encounter.
14. Use gloves and wear long-sleeved shirt when handling hazardous materials.
15. Be aware of pinch points and crushing hazards.
16. Take extra precaution to prevent heat and cold stress when working in extremely hot or cold temperatures.
17. Employees should wash hands before eating, drinking or smoking.
18. When cutting concrete, use concrete saw with integrated water delivery system to reduce RCS exposure below PEL.
19. If integrated water delivery system is not used, particulate respirator of assigned protection factor (APF) 10 or better must be used based on risk assessment.

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Concrete Pavement Maintenance SOP 11B-15

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Required Personal Protective Equipment (PPE) (Based on job specific hazard review)

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<td>Rubber Boots</td>
<td>Hearing Protection</td>
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<td>Particulate respirator if RCS above PEL</td>
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</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Implement Traffic Control Plan as specified in both NCDOT Standard Specifications and Drawings for Work Zone Traffic Control and MUTCD.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
5. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot.
6. Review SDS’s for each material used.
7. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
8. Be aware of loose material, excavation drop-offs, tripping hazards, uneven ground and other obstructions.
9. Allow ample space for each employee to work safely.
10. Use proper lifting and handling techniques while breaking and loading old concrete.
11. Wear rubber boots and rubber gloves when working with fresh concrete.
12. Watch for flying sand and rock from sweeping operation and adjacent traffic.
13. Be aware of flying debris, wind, moving traffic, jack hammers, saws, picks, etc.
14. When cutting concrete, use concrete saw with integrated water delivery system to reduce RCS exposure below PEL.
15. If integrated water delivery system is not used, particulate respirator of assigned protection factor (APF) 10 or better must be used based on risk assessment.
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<thead>
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Construction Elevations on Bridge Beams

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<tbody>
<tr>
<td>Body Harness/Lanyard</td>
<td>Personal Flotation Device</td>
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1. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicle.
2. Avoid walking or working under suspended loads.
3. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.
4. Do not work on beams without fall protection.
5. Personal flotation devices may be required, when working over water.
6. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
7. Keep walk spaces and work areas free of loose materials and tools.
8. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.

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Crack Sealing SOP 11B-17

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Required Personal Protective Equipment (PPE)

(Based on job specific hazard review)

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<th>Safety Vest</th>
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<tbody>
<tr>
<td>Safety Glasses</td>
<td>Face Shield</td>
<td>Hearing Protection</td>
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</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
6. Keep fire extinguishers available at all times when using a fired kettle. Extinguishers should be on the other equipment, not the kettle.
7. Use caution when handling hot/flammable materials. Review SDS's for each material used. Avoid direct contact. Make sure the sight glass is clear and visible with no rust on the tank.
8. Do not adjust burners or fill pour pots while kettle/distributor is in motion.
9. Allow ample space for each employee to work safely.
10. Be aware of flying sand, dust or other debris when blowing out cracks with compressed air. Maintain a low angle with the wand pointing away from you and other crew members. Eye protection and face shield must be worn. Be aware of wind direction and try to work upwind.
11. Use proper lifting and handling techniques when pouring cracks and shoveling blotting material.
13. Before backing, make sure area is clear and use an observer when available.
14. When loading mobile crack sealing trailers, stop the operation. Do not put your feet under the wheels of the trailer.
15. While operating the equipment, maintain your vehicle pace based on the slower operation (liquid wand operator or HP air operator wand).
16. When loading new tar blocks, stand to the side of the loader door and then close. Avoid overfilling to prevent backsplash. Make sure you have safety glasses and a face shield on.
17. Wear hearing protection while operating high pressure air compressors or working next to tar kettles being pulled.
18. Do not clean yourself or others off with compressed air. You can rupture your ear drum if you blow compressed air too close to the ear. Air can also enter bloodstream through any open cuts.
19. Turn off circulating pump and secure while at lunch or when moving to another location.

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Demolition of Structure SOP 11B-18

Hazard Review

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Required Personal Protective Equipment (PPE)

<table>
<thead>
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<th>Safety Glasses/Goggles</th>
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</thead>
<tbody>
<tr>
<td>Gloves</td>
<td>Body Harness/Lanyard</td>
<td></td>
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</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Keep an escape route cleared in case of emergencies.
3. Never wreck a structure, which could cause another part to fall.
4. Allow plenty of room for a person to work.
5. Avoid cutting one end of a structure allowing it to swing.
6. Keep area where majority of work is being done clean enough to flee danger without stumbling or falling.
7. Keep dust and trash as minimal as possible.
8. Ensure that an asbestos inspection is made when there is suspicion of asbestos in the structure.
9. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

Related SOP’s

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Density Inspection

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Required Personal Protective Equipment (PPE)

<table>
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<tr>
<th>PPE</th>
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<tr>
<td>Safety Shoes</td>
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<tr>
<td>Hard Hat</td>
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</table>

1. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
2. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
3. Proper lifting techniques shall be used. Get help or use equipment if necessary.
4. Be aware of others when swinging pickax.
5. Be certain that propane tanks have been secured in off position. Ventilate area for 5 minutes before relighting blow pot.
6. Be aware of hot materials when drying moisture sample in frying pan.
7. Ensure that equipment operators and all concerned personnel on the job site are aware that a density test is being performed and the location of the density inspection on the job site. Use flasher, flag, cones, or drums to identify the location of the density gauge. Use a second person for a spotter if necessary.
8. Have a fire extinguisher available.

Related SOP’s

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Drawbridge Maintenance

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Required Personal Protective Equipment (PPE)

| Safety Vest | Safety Shoes | Hard Hat |
| Gloves | Safety Glasses | Hearing Protection |

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Avoid walking and working under suspended loads.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
6. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Be aware of escape routes in case of emergency.
8. Be aware of loose materials, drop-off, tripping hazards and other obstructions. Keep walk spaces and work areas free from loose materials and tools.
9. Allow ample space for each employee to work safely. Be aware of other employees in the work areas.
10. Watch for poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high-top boots in suspect areas.
11. Be alert to protruding nails or spikes in decks and rails.
12. Review MSDS for all hazardous materials being used or expected to be encountered.
14. Be aware of pinch points and crushing hazards.
15. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
16. Do not leave tools or materials in areas where vibration could cause them to fall.
17. Maintain communications between employees at all times.
18. Always lockout controls when working on machinery.
19. All electrical tools shall be properly grounded and insulated.

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Dredging (Construction Crew) SOP 11B-21

Hazard Review

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1. Construction equipment shall be operated in a safe manner, as established in applicable training programs, manufacturers’ guidelines and applicable Equipment Safe Operating Procedures.
2. When operating construction equipment, be alert for other people or obstructions in the immediate vicinity.
3. When necessary to jump-start equipment, use only those procedures approved by the equipment manufacturer.
4. When operating construction equipment, avoid any medications which cause drowsiness or which decrease alertness.
5. Be alert for quicksand and potential cave-ins near trenches.
6. Proper lifting techniques shall be used. Get help or use lifting equipment if necessary.
7. Maintain first aid kit at construction site.
8. Equipment operators should never work at a site alone. Also, keep two-way radio handy.
9. Use caution when working with dredge pipeline. Never position yourself or equipment under raised pipeline.
10. Use caution when working with pipeline fusing machine. Guard against contact with hot surfaces and sharp edges.
11. Post signs around spoil area to keep public away from the site.
12. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.

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Dredging (Operations)  
SOP 11B-22

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Required Personal Protective Equipment (PPE)

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1. Hearing protection shall be worn in designated areas. Personal Flotation Device shall be worn when working in areas where slips, trips and falls would likely result in falling overboard. Protective gloves shall be worn when handling cable.

2. Be aware of loose objects, slippery decks, tripping hazards, uneven deck coatings, “headbangers” and other obstructions. Always use handrails when ascending or descending ladders.

3. Proper lifting techniques shall be used. Get help or use lifting equipment if necessary.

4. Confined spaces must be well ventilated prior to entry and checked by a certified competent person. Never enter a confined space without a standby observer.

5. Never leave doors ajar. Doors should be securely closed or hooked in the opened position. Be mindful of stress on doors due to either created vacuum or high wind.

6. Ensure shore connections are de-energized before connecting shore power. Before using portable power tools, inspect for frayed or cut wiring, loose connections and proper grounding.

7. Provide adequate ventilation when cleaning with chemicals or painting.

8. Always stand on rubber padding when working around switchboards.

9. Be alert for falling or shifting objects during heavy weather conditions.

10. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.

11. When working with dredge pipeline, never position yourself or equipment under the raised pipeline.

12. Use caution when working with pipeline fusing machine. Guard against contact with hot surfaces and sharp edges.

13. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

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Drift Removal SOP 11B-23

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**Required Personal Protective Equipment (PPE)**
*(Based on job specific hazard review)*

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<tr>
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1. Follow all manufacturers’ guidelines.
2. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
3. Determine traffic control needs from the Work Zone Safety Handbook.
4. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
5. Avoid walking and working under suspended loads.
6. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
7. Proper lifting techniques shall be used. Get help or use equipment if necessary.
8. Be aware of escape routes in case of emergency.
9. Be aware of loose materials, tripping hazards and unstable footing on brush, logs and other drift material. Keep walk spaces and work areas free from loose materials or tools.
10. Allow ample space for each employee to work safely. Be aware of other employees in the work areas.
11. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
12. Review SDS for all hazardous materials being used or expected to be encountered.
14. Be aware of pinch points and crushing hazards.
15. Employees should wash hands before eating, drinking or smoking.
16. Do not leave tools or materials in areas where vibration or wave action could cause them to fall.
17. Maintain communications between employees at all times.
18. Be alert to swinging loads and loads suddenly being snatched due to tensile load from cable and winch.
19. Be aware that swift-moving currents can cause a sudden increase in load on cable and boom if attached to material that breaks free from the drift pile.
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Drilled Shaft Inspection

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1. A drilled shaft is a permit-required confined space and requires specialized training before employees may enter. All conditions (e.g., atmospheric monitoring by a qualified person, proper ventilation if required and proper respiratory protection equipment) related to a permit-confined space must be met before employee entrance.

2. Spoil materials and all excavated and loose material should always be piled at least 2 feet away from the shaft surface opening or the edge of the excavation.

3. The shaft should be cased from the ground elevation to near the bottom of the excavation. The casing should be no smaller than 12 inches (preferably 6 inches) less than the shaft diameter. The casing itself should be no smaller than 30 inches in diameter. It should be verified that the casing is thick enough to prevent buckling under soil and water pressure.

4. The components involved with drilled shaft entry include:
   - A load line with a boatswain chair that lowers and lifts personnel into and out of the drilled shaft
   - A vertical lifeline that attaches to the personnel’s safety harness and that is separate from the load line and is secured in a manner that will provide prompt rescue and fall protection in the event of a load line failure.
   - An optional safety rope that could be sued as an alternate method of communication

5. No loose or flowing clothing is allowed. Down-hole personnel must wear hearing protection where the use of mechanical or electrical equipment in the shaft generates high noise levels.

6. If a crane is used for hoisting, an anti-two block device must be used on the load line of the crane. A hook with an automatic safety catch should be used on the hoisting cable.

7. The person entering the shaft should mount the boatswain chair (personnel carrier) adjacent to the shaft after having a lifeline secured to the back D-ring of the safety harness. Then the crane’s load line with the boatswain chair (personnel carrier) should be placed over the shaft.

8. The person being lowered into the hole should be lowered in a safe, slow and controlled fashion by the boatswain chair (personnel carrier) that is connected to the load line of a crane. Lowering should be stopped when the individual being lowered signals or when the individual indicates that the bottom of the shaft has been reached.

9. Equipment should be lowered into the shaft prior to personnel whenever possible. Conversely, personnel should be lifted out of a shaft prior to the removal of any equipment.
10. Personnel working in drilled shaft excavations should never disconnect their lifeline from their safety harness while working inside a drilled shaft.

11. Air powered equipment should be pinned or secured so that there is no danger of the release of high pressure air lines while personnel are in the shaft.

12. If water cannot be removed from the shaft, then alternative means of inspecting the shaft (such as a remote camera) should be used. Dewatering should continue as necessary during down-hole operations. A shaft with water in it shall be entered only if equipment is available to remove accumulating water. Surface water should be prevented from entering the excavation.

13. Machines that produce exhaust should not be operated in the vicinity of the shaft during the inspection.

14. Any welding or heating activities should be prohibited during drilled shaft inspections. Welding should not be conducted in or around shafts where combustible gases have been detected until ventilation or other remedial measures have reduced concentrations of contaminants to below safe levels.

15. After work in the shaft has been completed, personnel should be raised in a slow and controlled fashion.

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Drilled Shaft Inspection – SOP 11B-24
SAFE OPERATING PROCEDURES

Earth Moving

Hazard Review

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1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Implement Traffic Control Plan as specified in both NCDOT Standard Specifications and Drawings for Work Zone Traffic Control and MUTCD.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Locate all utilities in and near the work site prior to commencing work. Call NC 811 to have utilities located and marked prior to starting project.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment. Avoid areas behind equipment.
6. Be aware of escape routes in case of emergency. It is a good practice to work facing oncoming traffic while on foot.
7. Allow ample space for each employee to work safely.
8. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
9. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
10. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
11. Strictly adhere to departmental policy regarding handling of explosives. Utilize licensed specialists in this operation.
12. Avoid walking and working under suspended loads. Wear hard hat when working around backhoes, cranes, excavators, etc.
13. Before backing, make sure area is clear and use an observer when available.
14. Equipment operator should be in an enclosed air-conditioned filtered cab. If enclosed cab is not available, water suppression should be applied to control dust.
15. This task is included in NCDOT Silica Exposure Control Plan.
16. If a dust cloud is visible during the operation, sampling may be required.

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Electrical Maintenance of Movable Span Bridges

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1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Proper lifting techniques shall be used. Get help or use equipment if necessary.
5. Whenever possible, perform work while facing traffic.
6. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.
7. Do not work over rails or bridge structures without being properly secured.
8. When servicing batteries be aware of hazards due to toxic gas or liquid exposure. Always wear hand and eye protection.
9. When working at night, have adequate lighting available.
10. Always use proper testing equipment and procedures.
11. Always use radios or two-way communication for electrical maintenance involving bridge operation.
12. Review MSDS for all hazardous materials being used or expected to be encountered.
13. Plan and conduct trouble shooting and maintenance to minimize traffic interruption and risks.
14. Keep bridge operators briefed at all times as to status of maintenance/trouble shooting.
15. Employees should wash hands before eating, drinking or smoking.
16. Always lockout and tag controls before performing any maintenance or repairs on draw span machinery.

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| Drawbridge Maintenance ................................11B-18 | Ladder ....................................................12B-15 |
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SAFE OPERATING PROCEDURES

Electrical Maintenance of Navigational Lighting – SOP 11B-27

**Hazard Review**
Moving Traffic               Parking               Toxic Materials
Electrical Shock             Slip, Trip and Fall

**Required Personal Protective Equipment (PPE)**
Safety Glasses/Goggles       Hard Hat               Safety Shoes
Safety Vest                  Gloves                 Personal Flotation Device
Body Harness/Lanyard

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Proper lifting techniques shall be used. Get help or use equipment if necessary.
5. Whenever possible, perform work while facing traffic.
6. Do not work over rails or bridge structures without being properly secured.
7. When servicing batteries be aware of hazards due to toxic gas or liquid exposure. Always wear hand and eye protection.
8. When working at night, have adequate lighting available.
9. Always use proper testing equipment and procedures.
10. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

**Related SOP’s**
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Environmental Assessment Activities SOP 11B-28

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Required Personal Protective Equipment (PPE)

| Safety Vest | Safety Shoes | Safety Glasses |
| Hard Hat | Protective Clothing | Respirators |

1. All posted MSDSs should be read and followed.
2. Protective clothing, respirators and other equipment may be required.
3. Avoid working under suspended loads. Wear hard hats around backhoes, cranes and excavators.
4. Evaluate site and follow Excavation, Trenching and Shoring Standards.
5. All employees shall be trained in the proper procedures for handling hazardous materials.
6. All employees must follow established procedures for entering confined spaces.
7. Beware of containers with unknown and/or unlabeled substances. Accidental mixing of waste materials could cause a chemical reaction resulting in fire, explosion or atmospheric release of toxic vapors. Be alert for heat buildup, vapors, rumbling noises, leaks, dampness, unusual debris and strange odors caused by airborne contaminants.
8. Park in areas that: provide safe entrance and exit of work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers entering and exiting the vehicle.
9. Employees on foot must use caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
10. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
11. Take extra precautions to prevent heat and cold stress when working in extremely hot and cold temperatures.
13. All work should be performed in well-ventilated areas.

Related SOP’s

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**Required Personal Protective Equipment (PPE)**

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1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Be aware of escape routes in case of emergency. It is a good practice to work facing oncoming traffic while on foot.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
6. Allow ample space for each employee to work safely.
7. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, Gloves and high-top boots when hazards cannot be avoided.
8. Avoid walking and working under suspended loads. Wear hard hat when working around equipment.

**Related SOP’s**

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Required Personal Protective Equipment (PPE)

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1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Avoid walking and working under suspended loads. Hard hats must be worn when working around backhoes, cranes, excavators, etc.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
6. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Be aware of escape routes in case of emergency.
8. Be aware of loose materials, tripping hazards and other obstructions.
9. Allow ample space for each employee to work safely. Be aware of other employees in the work areas.
10. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
11. Be alert to protruding nails or spikes in decks and rails.
12. Keep walk spaces and work areas free from loose materials or tools.
13. Review MSDS for all hazardous materials being used or expected to be encountered.
15. Be aware of pinch points and crushing hazards.
16. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
17. Employees should wash hands before eating, drinking or smoking.
18. Do not leave tools or materials in areas where vibration or wave action could cause them to fall.
19. Maintain communications between employees at all times.
20. All electrical tools shall be properly grounded and insulated.

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Hazard Review

Noise | Pressurized Systems | Slip, Trip and Fall
Electrical Shock | Hot Surfaces | Fire
Moving Machinery Parts | Confined Spaces | Unsecured Objects

Required Personal Protective Equipment (PPE)

| Safety Shoes | Safety Glasses/Goggles | Hearing Protection
| Gloves | Personal Flotation Device |

1. Eye protection shall be worn when working on batteries. Hearing protection shall be worn in designated areas. Personal Flotation Device shall be worn when working in areas where slips, trips, or falls would likely result in falling overboard.

2. Be aware of loose objects, slippery decks, tripping hazards, uneven deck coamings, “headbangers” and other obstructions. Always use handrails when ascending or descending ladders.

3. Proper lifting techniques shall be used. Get help or use equipment if necessary.

4. Confined spaces must be well ventilated prior to entry and checked by a certified competent person. Never enter a confined space without a standby observer.

5. Never leave doors ajar. Doors should be securely closed or hooked in the opened position. Be mindful of stress on doors due to either created vacuum or high wind.

6. Ensure shore connections are de-energized before connecting shore power. Before using portable power tools, inspect for frayed or cut wiring, loose connections and proper grounding.

7. Provide adequate ventilation when cleaning with chemicals or painting.

8. Always stand on rubber padding when working around switch boxes or electrical panels.

9. Be alert for falling or shifting objects during heavy weather conditions.

10. Check pressurized piping, hoses, tanks, steering systems, etc. for unsafe conditions prior to work. De-energize, de-pressurize and/or exercise systems prior to repair. If in doubt, consult supervisor.

11. Be aware of fire extinguishers, alarm and hose locations. Check routinely to make sure they are working properly. Follow good housekeeping practices to reduce the risk of fires.

12. Read product labels, MSDS’s and manufacturer’s labels before handling chemicals. Hazardous materials should be properly stored and must be in accordance with manufacturer’s guidelines.

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Required Personal Protective Equipment (PPE)

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1. Hearing protection shall be worn in designated areas.
2. Proper lifting techniques shall be used. Get help or use equipment if necessary.
3. Confined spaces must be well ventilated prior to entry and checked by a certified competent person. Never enter a confined space without a standby observer.
4. Be aware of loose objects, slippery decks, tripping hazards, uneven deck coamings, “headbangers” and other obstructions. Always use handrails when ascending or descending ladders.
5. Always stand on rubber padding when working around switch boxes and electrical panels.
6. Accessory equipment (welders, forklifts, boom truck, etc.) shall be operated in a safe manner as established in applicable training programs and manufacturer’s guidelines.
7. When using compressed air for cleaning, never bypass or alter the pressure reducing system.
8. Use the right tool for the job. Replace worn or broken tools such as cracked hammer handles and mushrooming chisel heads. Never surpass the pneumatic tool’s recommended air pressure.
9. Read product labels, MSDS’s and manufacturer’s labels before handling chemicals. Hazardous materials should be properly stored and must be in accordance with manufacturer’s guidelines.
10. Be aware of fire extinguishers, alarm and hose locations. Check routinely to make sure they are working properly. Follow good housekeeping practices to reduce the risk of fires.
11. When cleaning parts, use only approved cleaning materials with good ventilation.
12. Check pressurized piping, hoses, tanks, steering systems, etc. for unsafe conditions prior to work. De-energize, de-pressurize and/or exercise systems prior to repair.

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Ferry Operations

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1. Hearing protection shall be worn in designated areas. Personal Flotation Devices shall be worn when working in areas where slips, trips, or falls would likely result in falling overboard. Protective gloves shall be worn when handling cable.
2. Be aware of loose objects, slippery decks, tripping hazards, uneven deck coamings, “headbangers” and other obstructions. Always use handrails when ascending or descending ladders.
3. Proper lifting techniques shall be used. Get help or use equipment if necessary.
4. Confined spaces must be well ventilated prior to entry. Never enter a confined space without a standby observer.
5. Use caution around mooring lines. Never stand in the bight of a line. Stand well clear of mooring lines which are under heavy stress.
6. Never stand in position where you can be injured by moving vehicles. Be alert for non-attentive drivers. To ensure safe work zone, advise passengers to remain in vehicles until ferry is under way.
7. Never leave doors ajar. Doors should be securely closed or hooked in the opened position. Be mindful of stress on doors due to either created vacuum or high wind.
8. Before using portable power tools, inspect for frayed or cut wiring, loose connections and proper grounding.
9. Provide adequate ventilation when painting or when cleaning with chemicals.
10. Be alert for falling or shifting objects during heavy weather conditions.
11. Be aware of fire extinguishers, alarm and hose locations. Check routinely to make sure they are working properly. Follow good housekeeping practices to reduce the risk of fires.

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Ferry Shore Facilities

SOP 11B-34

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1. Never stand in position where moving vehicles can injure you. Be alert for non-attentive drivers.
2. Wear safety toe shoes when mowing and wear eye protection and face shield when using string trimmer. Personal Flotation Devices shall be worn when working in areas where slips, trips or falls would likely result in falling overboard. Wear Safety vests at all times when handling traffic.
3. Use appropriate tools or equipment where applicable (such as: use stepladder to reach top shelf items in supply room).
4. Proper lifting techniques shall be used. Get help or use lifting equipment if necessary.
5. Read product labels, MSDS’s and manufacturer’s labels before handling chemicals. Hazardous materials should be properly stored and must be in accordance with manufacturer’s guidelines.
6. Provide adequate ventilation when painting or when cleaning with chemicals.
7. Before using portable power tools, inspect for frayed or cut wiring, loose connections and proper grounding.
8. Be aware of fire extinguishers, alarm and hose locations. Check routinely to make sure they are working properly. Follow good housekeeping practices to reduce the risk of fires.

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1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles. The use of flashers and strobe lights is recommended to alert oncoming traffic.
4. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
5. Proper lifting techniques shall be used. Get help or use equipment if necessary (lifting and carrying EDM and supplies).
6. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions. Newly seeded areas are especially hazardous. Shoulders could be slick due to wetness or thawing.
7. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
8. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot. Remain alert to oncoming traffic for yourself as well as other crewmembers.
9. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
10. Do not leave equipment, such as tripods, unattended when positioned in roadway or adjacent thereto.
11. Use of radios may speed work, reduce traffic delay and improve safety in high traffic areas. Consider working during off peak hours.
12. Take extra precautions when sharpening hand tools. Use gloves and shields on files to protect hands.
13. When driving stakes and cutting brush, ensure a clear distance from coworkers. Use extra caution to avoid hitting leg, foot or other employees.

Related SOP’s

- General SOPs ............................................Chapter 10
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- Hand Removal of Vegetation ........................... 11B-42
- Hand Tools (Power and Manual) ...................... 12B-13
SAFE OPERATING PROCEDURE

Geographic Hazards

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Required Personal Protective Equipment (PPE)

| Safety Shoes | Safety Glasses | Gloves |
| Body Harness/Lanyard/Lifelines |

1. Be alert for tripping hazards such as loose rocks, logs, hidden objects, holes and uneven ground.
2. When climbing or rappelling always have a companion along.
3. Inspect safety lines and equipment prior to rappelling.
4. Supervisors shall ensure that employees who use rappelling equipment have the necessary training.
5. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. Wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
6. Be aware of sinkholes and quick sand areas in swamps and coastal plain areas.
7. Be cautious of dead trees and limbs in wooded areas.
8. Be aware of deer and big game hunters during the hunting season. The use of bright orange traffic vests or blaze orange clothing is recommended when working in wooded areas during hunting seasons.
9. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

Related SOP’s

General SOPs

Chapter 10

Geographic Hazards – SOP 11B-36
# Safe Operating Procedures

## Geotechnical Drilling Operations - SOP 11B-37

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1. Avoid contact with rotating drilling equipment.
2. When cathead is in use, assure a safe travel path for the rope by using proper technique. Avoid standing on the rope.
3. Observe and stay clear of overhead utility lines. Have underground utilities properly located prior to drilling.
4. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching the equipment.
5. Be aware of drop-offs, uneven ground and hidden objects that may cause loss of control when maneuvering drill rigs or create unstable drill set-ups. In heavily wooded terrain, the need for a scout may be necessary to locate hidden obstacles.
6. Drill rod stacking must not exceed a length of 1.5 times the height of the tower.
7. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. Wear long sleeve shirts, gloves and high top boots when hazards cannot be avoided. Proper first aid and insect repellents should accompany field crews.
8. A combination of conditions can lead to slippery surfaces. High groundwater conditions resulting in muddy soils brought to the surface by augers as well as the utilization of bentonite drilling fluid are the predominant problem areas. Be alert for these conditions!
9. Inspect all cables and clamps prior to winching operation. Stand clear of winching operation.
10. Use proper lifting techniques. Get help or use lifting equipment, if necessary.
11. Drilling operations should be suspended immediately during electrical storms.
12. Be aware of overhead hazards, which may come in contact with drill rig when moving or setting up equipment.
13. Review daily operations checklist to ensure that equipment is working properly. Make special note of emergency KILL switches.

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</table>
SAFE OPERATING PROCEDURES

Geotechnical Roadside Operations SOP 11B-38

Hazard Review

<table>
<thead>
<tr>
<th>Overcrowding of Workers</th>
<th>Moving Traffic</th>
<th>Moving Equipment</th>
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</thead>
</table>

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Shoes</th>
<th>Safety Vest</th>
<th>Safety Glasses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
<td>Hearing Protection</td>
<td></td>
</tr>
</tbody>
</table>

1. Determine the traffic control needs from the Work Zone Safety Handbook.
2. Safety vests are essential when working in close proximity to traffic.
3. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot.
4. Allow ample space for each employee to work safely and stay out of the traffic zone.
5. Park in areas that: provide safe entrance and exit of work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers entering and exiting the vehicle.
6. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching the equipment.

Related SOP’s

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<tbody>
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Geotechnical Barge Operations

SAFE OPERATING PROCEDURES

Hazard Review

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Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Equipment</th>
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</thead>
<tbody>
<tr>
<td>Safety Shoes</td>
</tr>
<tr>
<td>Safety Glasses</td>
</tr>
<tr>
<td>Personal Flotation Device</td>
</tr>
<tr>
<td>Gloves</td>
</tr>
</tbody>
</table>

1. Be aware of slippery decks, tripping hazards and loose objects. Personal Floatation Devices will be worn when working on barge since slips, trips and falls would likely result in falling overboard.
2. Always use qualified signalman with crane operation. Inspect cables and clamps to ensure that they are in good working condition and they meet OSHA requirements.
3. Be alert for crushing injuries.
4. Barge operations shall be suspended immediately in the event of an electrical storm. Be alert for falling or shifting objects during heavy weather conditions.
5. Inspect all cables and clamps prior to winching operation. Stand clear of winching operation.
6. Proper lighting should be used to alert nighttime boaters of the barge operation. Lighting should meet U.S. Coast Guard and U.S. Fish and Wildlife Standards.

Related SOP’s

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<thead>
<tr>
<th>SOPs</th>
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<td>General SOPs ..................</td>
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SAFE OPERATING PROCEDURES

Grouting Operations

Hazard Review

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<td>Moving Traffic</td>
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</tr>
<tr>
<td>Noise</td>
<td>Slip, Trip, and Fall</td>
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<tr>
<td>Lifting</td>
<td>Respirable Crystalline Silica (RCS)</td>
<td>Moving Equipment</td>
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Required Personal Protective Equipment (PPE) (Based on job specific hazard review)

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<th>Equipment</th>
<th>Action 1</th>
<th>Action 2</th>
<th>Action 3</th>
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</thead>
<tbody>
<tr>
<td>Safety Shoes</td>
<td>Safety Glasses/Goggles</td>
<td>Safety Vest</td>
<td></td>
</tr>
<tr>
<td>Particulate Respirator w/ APF of 10 or greater if Integrated Water System not used.</td>
<td>Gloves</td>
<td>Hearing Protection</td>
<td></td>
</tr>
</tbody>
</table>

1. Eye and ear protection should be worn around pressurized hoses. Breathing masks should be worn during the mixing operation to prevent dust inhalation.
2. Be aware of loose material, lines and hoses, excavation drop-offs, uneven and sloping ground and other obstructions.
3. Avoid contact with mixers, paddles and belts while in operation.
4. Determine the traffic control needs from the Work Zone Safety Handbook.
5. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment in the work area; and provide maximum protection for workers getting in and out of the vehicles.
6. Be aware of escape routes in case of emergency. It is a good practice to work facing oncoming traffic while on foot.
7. Employees on foot must use caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
9. Proper lifting techniques should be used. Get help or use equipment if necessary.
10. Allow ample space for each employee to work safely.
11. Parking grout truck upwind and using portable fans will minimize dust exposure when bags of grout are dumped into mixer pot.
12. For employees dumping bags of grout or operating mixer pot on the grout truck, particulate respirator of assigned protection factor (APF) 10 or better must be used based on risk assessment unless further exposure sampling determination has been completed.

Related SOP’s

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<tbody>
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### SAFE OPERATING PROCEDURES

**Guardrail Installation/Maintenance**  
**SOP 11B-41**

#### Hazard Review

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<tr>
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<th>Slip, Trip and Fall</th>
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<tbody>
<tr>
<td>Moving Equipment</td>
<td>Heavy Materials</td>
<td>Lifting</td>
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<tr>
<td>Animals</td>
<td>Poisonous Plants/Snakes/Insects</td>
<td>Crushing</td>
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<tr>
<td></td>
<td>Cutting/Welding Galvanized Materials</td>
<td></td>
</tr>
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#### Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Vest</th>
<th>Safety Shoes</th>
<th>Safety Glasses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
<td>Hard Hat</td>
<td></td>
</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
5. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot.
6. Have fire extinguishers available when welding/cutting.
7. Do not use a welder or torch on guardrail without a proper respirator since galvanized materials contain zinc and will release poisonous gasses.
8. Be alert to sharp or jagged edges, burns and splinters when handling guardrail and posts, especially that which has been damaged.
9. Be aware of loose material, excavation drop-offs, tripping hazards, uneven ground and other obstructions.
10. Allow ample space for each employee to work safely.
11. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
12. Proper lifting techniques shall be used. Get help or use equipment if necessary.
13. Be aware of crushing hazards and pinch points when fastening or handling guardrail. Use a pry bar to align holes.
14. Work from back side of guardrail when removing rail from posts.

#### Related SOP’s

- General SOPs .............................................Chapter 10  
  Welding, Oxy-Acetylene Cutting ..................11A-40
- Welding, Arc .............................................11A-39  
  Post Driver ..................................................12A-15
- Truck, Crew Cab and Flatbed ......................12A-29  
  Hand Tools (Power and Manual) ...................12B-13
- Tractor Attachments .................................12B-29
SAFE OPERATING PROCEDURES

Hand Removal of Vegetation

Hazard Review

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<td>Sharp Edged Tools</td>
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<td>Thorns</td>
<td>Unwieldy Brush</td>
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<td>Overcrowding of Workers</td>
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<td>Animals</td>
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Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>Safety Shoes</td>
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<tr>
<td>Hard Hat</td>
<td>Gloves</td>
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<tr>
<td>Face Shield</td>
<td>Chain Saw Chaps</td>
</tr>
<tr>
<td>Safety Glasses</td>
<td>Hearing Protection</td>
</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Hearing and eye protection are required when using chain saws or chippers. Use of worker leg protection is recommended when operating chain saw.
5. Cut and stack brush in manageable pieces that are easily handled to avoid back injuries.
6. Utilize appropriate mechanical means when moving large quantities of brush.
7. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
8. Allow ample space for each employee to work safely. Don’t bunch up.
9. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
10. Chain saw and chipper operators must be trained and qualified.
11. Use caution when handling tools with sharp edges.
12. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
13. Do not cut limbs that may contact overhead utility lines. Observe and stay clear of overhead utilities.
14. Tree-trimming which would require climbing shall only be performed by a specialist or with the assistance of a bucket truck.
15. Use extreme care when cutting trees, brush, etc. that are under stress, e.g., ice conditions.

Related SOP’s

- General SOPs ........................................ Chapter 10
- Truck, Aerial Device ................................. 12A-26
- Truck, Crew Cab and Flatbed ....................... 12A-29
- Brush Chipper ......................................... 12B-3
- Chain Saw and All-Purpose Cut-Off Saw ......... 12B-4
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SAFE OPERATING PROCEDURES

Herbicide and other Spraying Operations SOP 11B-43

Hazard Review

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<tr>
<td>Moving Equipment</td>
<td>Poisonous Plants/Insects/Snakes</td>
<td>Animals</td>
</tr>
</tbody>
</table>

Required Personal Protective Equipment (PPE)

| Safety Vest | Safety Shoes | Safety Goggles |
| Face Shield | Coveralls | Impermeable Gloves and Boots |

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook. The use of a shadow vehicle with crash attenuator is recommended for high volume and/or high-speed roadways.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Wear all additional equipment required by chemical label and U.S. Department of Agriculture.
5. Refer to instructions for applying or mixing chemicals.
6. Read product labels, MSDS and pest control recommendations before handling chemicals. The documents are required to be at application site.
7. Make sure soap and water are available at work site.
8. Do not exceed recommended pressure, check for wear and tear on hoses, and make sure pressure regulator is working. Test pump and system and calibrate prior to adding chemicals.
9. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
10. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
11. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
12. When operating spray trucks off roadway, be aware of hidden objects in grass and unstable terrain.
13. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
15. Before backing make sure area is clear and use an observer when available.
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<thead>
<tr>
<th>Related SOP’s</th>
<th>Chapter/Section</th>
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<td>Hazardous Waste Handling and Storage</td>
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<td>Truck, Crew Cab and Flatbed</td>
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<td>Fumigation (Gassing) Rig</td>
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Herbicide and other Spraying Operations – SOP 11B-43
SAFE OPERATING PROCEDURES

Inmate Labor

SOP 11B-44

Hazard Review

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<th>Moving Traffic</th>
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<td>Temperature Extremes</td>
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Required Personal Protective Equipment (PPE)

<table>
<thead>
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<th>Safety Vest</th>
<th>Safety Shoes</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Hard Hat</td>
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</table>

1. Inmates should be supervised only by employees who have been trained and designated by the N.C. Department of Correction as a Custodial Agent.
2. Supervisors should be aware of security requirements.
3. Determine the traffic control needs from the Work Zone Safety Handbook.
4. Traffic control needs for medium custody inmate labor operations is the responsibility of the N.C. Department of Correction.
5. Inmates used as flagmen should be trained in proper flagging procedures. They should also be equipped with safety vests or orange shirts, and orange hats or hard hats with orange covers.
6. Supervisors shall verify that inmates are capable and qualified on each type of equipment before allowing the equipment to be operated.
7. No inmate shall be allowed to ride anywhere except in the cab when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
8. Inmates shall wear seat belts and/or shoulder harnesses as provided.
9. When entering or exiting equipment, use steps and handholds provided. Do not jump from vehicle.
10. Inmates should be trained how to use shop tools before being allow to use them.

Related SOP’s

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SAFE OPERATING PROCEDURES

Inspection of Existing Bridges SOP 11B-45

### Hazard Review

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<td>Poisonous Plants/Insects/Snakes</td>
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### Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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<th>Safety Shoes</th>
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<tbody>
<tr>
<td>Hard Hat</td>
<td>Body Harness/Lanyard</td>
<td>Personal Flotation Device</td>
</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. When working over or near water, where the danger of drowning exists;
   a. Employees shall wear personal flotation device.
   b. Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.
   c. At least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water.
5. Avoid walking and working under suspended loads. Hard hats must be worn when working around backhoes, cranes, excavators, etc.
6. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
7. Proper lifting techniques shall be used. Get help or use equipment if necessary.
8. Be aware of escape routes in case of emergency.
10. Keep walk spaces and work areas free from loose materials or tools.
11. Be sure there is firm footing and sound bottom when in water.
12. Allow ample space for each employee to work safely.
13. Locate all utilities in and near work site prior to beginning inspection.
14. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves, and high-top boots when hazards cannot be avoided.
15. Be alert to protruding nails or spikes in decks and rails.
16. Review SDS for all hazardous materials being used or expected to be encountered.
17. Review manufacturer’s recommended guidelines for proper use of ladder.
18. Be aware of pinch points and crushing hazards.
19. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
20. Employees should wash hands before eating, drinking or smoking.
21. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard, and life line.

<table>
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SAFE OPERATING PROCEDURES

Inspection of New Structures

Hazard Review

Parking  Temperature Extremes  Moving Equipment
Slip, Trip and Fall  Open Excavations  Overhead Loads
Explosives  Poisonous Snakes/Plants/Insects

Required Personal Protective Equipment (PPE)

Safety Vest  Safety Shoes  Safety Glasses
Hard Hat  Body Harness/Lanyard  Personal Flotation Device

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Check to ensure signing and traffic control is in accordance with project traffic control plans.
3. Park in areas that: provide safe entrance and exit of the area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Avoid walking and working under suspended loads.
5. Be aware of guidelines for proper trenching and excavation. Do not enter areas inadequately protected from cave-ins.
6. Be aware of contractor’s timetable when he is using explosives. Review MSDS for concrete.
7. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
8. Proper lifting techniques shall be used. Get help or use equipment if necessary. Exercise caution when carrying buckets filled with concrete.
9. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions. Use caution on catwalks, beams, girders and scaffolding. Use extra caution when walking on epoxy-coated steel.
10. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
11. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures. Reflection of sun from concrete intensifies force. Use proper sunscreen.
12. When performing inspection duties, note the location and proximity of construction equipment. If working in equipment blind spots, make sure contractor’s personnel know you are there.
13. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

Related SOP’s

General SOPs ...........................................Chapter 10  Scaffolding ..............................................12B-23
Pile Driving ..............................................11B-57  Excavating, Trenching and Shoring........ 11E-3
SAFE OPERATING PROCEDURES

Installation of Paint Lines SOP 11B-47
(Including Prelining and Hand Layout)

Hazard Review
- Moving Traffic
- Slip, Trip and Fall
- Lifting
- Paint and Exhaust Fumes
- Moving Equipment
- Sun Exposure

Required Personal Protective Equipment (PPE)
- Safety Shoes
- Safety Vest
- Gloves
- Safety Glasses/Goggles/Face Shield

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook. The use of a shadow vehicle with crash attenuator is recommended for high volume and/or high-speed roadways.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicle/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
5. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
8. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
9. Schedule operations to avoid work on high volume roads during peak traffic conditions.
10. Establish painting plan and review this with entire crew before beginning operation.
11. Paint only when visibility is good.
12. Wear a face shield when performing maintenance on paint guns.

Related SOP’s
- General SOPs........................................Chapter 10
- Paint Machine, Centerline..........................12A-12
SAFE OPERATING PROCEDURES

Lime/Cement Stabilization  
SOP 11B-48

Hazard Review

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<th>Hot Surfaces</th>
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<tr>
<td>Lifting</td>
<td>Caustic Materials</td>
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<tr>
<td>Respirable Crystalline Silica (RCS)</td>
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</tbody>
</table>

Required Personal Protective Equipment (PPE)  
(Based on job specific hazard review)

<table>
<thead>
<tr>
<th>Safety Vest</th>
<th>Safety Shoes</th>
<th>Safety Glasses/Goggles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particulate respirator if RCS above PEL</td>
<td>Hard Hat</td>
<td>Gloves</td>
</tr>
</tbody>
</table>

1. Eye and breathing protection should be worn around lime spreading operations.
2. Be aware of loose material, uneven ground, lines and hoses and other obstructions.
3. Avoid contact with moving machinery parts such as lime spreaders and mixers while in operation.
4. Be alert for sprayed slurry mixes from pressurized systems.
5. Avoid contact with mixers, which build up high temperatures that can cause severe burns.
6. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment in the work area; and provide maximum protection for workers getting in and out of the vehicles.
7. Employees on foot must use caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
9. Proper lifting techniques should be used. Get help or use equipment if necessary.
10. Be aware that when caustic materials such as quick lime comes in contact with bare skin and/or eyes it can cause severe burns. Avoid contact through caution and use of proper clothing, also wash off exposed skin areas thoroughly after exposure.
11. If this task is not listed in NCDOT Silica Exposure Control Plan and a dust cloud is visible during the operation, sampling may be required. Use particulate respirator of assigned protection factor (APF) 10 or better based on risk assessment.

Related SOP’s

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SAFE OPERATING PROCEDURES

Litter Pickup

SOP 11B-49

Hazard Review

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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<tbody>
<tr>
<td>Gloves</td>
<td>Insect Repellent</td>
<td>Pickup Tool</td>
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</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating near an adjacent work zone; and provide maximum protection for workers getting in and out of the vehicles. Never park near entrance to exit ramp. Avoid using traffic side and rear of truck to access and load vehicles. Always face traffic when exposed working around your vehicle.
4. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
5. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
6. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot.
7. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
8. Allow ample space for each employee to work safely.
9. Place tools in safe position so that sharp points are not exposed.
10. Be aware of hidden obstructions that may have sharp edges and broken glass, especially in grassy areas.
11. Properly identify material or object before handling. For unknown possible hazardous materials notify proper authorities.
12. Use caution when handling trash bags containing broken or sharp objects.
13. Place trash bags where they can be easily retrieved and clear of roadway traffic.
14. Use proper lifting techniques when loading trash bags.
15. Do not overload trash bags making them difficult to handle or throw into trucks. For trash bags that have broken glass, consider loading it with less material to prevent the glass from breaking through the bag.

16. When handling tires and broken tire treads, use caution and look for broken wires (Steel Belts), which can poke through gloves and clothing.

17. Get help when handling broken furniture, metal and other large bulky debris that may be hard to handle.

18. Do not ride in the cargo bed of vehicle while in motion, you must ride in the vehicle.

19. While seated in a stationary vehicle, always keep seat belt fastened until exiting.

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**Related SOP’s**

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Maintenance Stabilization of Unpaved Roads

Hazard Review

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Required Personal Protective Equipment (PPE) (Based on job specific hazard review)

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<tr>
<td>Gloves</td>
<td>Hearing Protection</td>
<td>Particulate respirator if RCS above PEL</td>
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</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Implement Traffic Control Plan as specified in both NCDOT Standard Specifications and Drawings for Work Zone Traffic Control and MUTCD.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicle.
4. Avoid walking or working under suspended loads.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Avoid areas behind operating equipment.
6. Observe and stay clear of overhead utility lines.
7. Be aware of loose material, excavation drop-offs, uneven ground and other obstructions.
8. Before backing, make sure area is clear and use an observer when available.
9. Be aware of stockpile stability when removing material. Do not leave vertical slopes in stockpiles that could collapse on a person on foot.
10. Truck drivers should stay in the cab while the truck is being loaded.
11. Be aware of escape routes in case of emergency.
12. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
13. If this task is not listed in NCDOT Silica Exposure Control Plan and a dust cloud is visible during the operation, sampling may be required. Water application to roadway should be used to minimize dust. Use particulate respirator of assigned protection factor (APF) 10 or better based on risk assessment if dust cloud persists.
Masonry Activities

SAFE OPERATING PROCEDURES

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<td>Gloves</td>
<td>Body Harness/Lanyard</td>
</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Employee on ground needs to keep eyes on scaffolding when walking or working under scaffold.
3. Avoid carelessly setting scaffold legs on soft, unleveled ground.
4. Use mud seal and build scaffolds level.
5. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.
6. Never set scaffolds so far apart that the boards do not have proper lap on each end.
7. Always use boards that will carry the expected load.
8. Avoid using undersize boards or knotty boards.
9. Properly stack and locate materials on boards in order to prevent materials from falling.
10. Use proper lifting techniques.
11. Review MSDS for each material used.

Related SOP’s

General SOPs.................................Chapter 10  Hand Tools (Power and Manual).................12B-13
Scaffolding........................................12B-23
SAFE OPERATING PROCEDURES

**Minor Shoulder Maintenance**

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*(Based on job specific hazard review)*

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<td>Safety Glasses</td>
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</table>

1. Follow all manufacturers’ guidelines.
2. Review Safe Operating Procedure for applicable equipment and perform pre-operational checks.
3. Determine the traffic control needs from the Work Zone Safety Handbook.
4. If flaggers are used, have the middle man stay in contact with flaggers by radio.
5. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
6. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot.
7. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
8. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
9. Be aware of loose material, excavation drop-offs, tripping hazards, uneven ground and other obstructions.
10. Allow ample space for each employee to work safely.
11. Use proper lifting and handling techniques while shoveling material.
12. Before backing, make sure area is clear and use a spotter when available. If spotter is not available, G.O.A.L. (get out and look before backing).
13. Watch for flying sand and rock from sweeping operation and adjacent traffic.
14. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided. Wear proper fitting clothes.

**Related SOP’s**

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Nondestructive Testing of Pavements SOP 11B-53

Hazard Review

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Required Personal Protective Equipment (PPE)

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<th>Safety Shoes</th>
<th>Gloves</th>
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</thead>
<tbody>
<tr>
<td>Safety Glasses/Safety Goggles</td>
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</table>

1. Review Safe Working Procedures for applicable equipment and perform pre-operational checks.
2. Determine traffic control needs from the Work Zone Safety Handbook. The use of a shadow vehicle equipped with a crash attenuator is required for high volume roadways.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide for maximum protection for workers getting in and out of the vehicle.
4. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
5. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
6. Before backing, make sure area is clear and use an observer when available.
7. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
8. Be aware of fire extinguisher locations and routinely check to see that they are properly charged.
9. Determine if weather conditions are safe for the performance of the day’s work.
10. Stay clear of weight package when FWD is in operation.

Related SOP’s

General SOPs ........................................ Chapter 10  Trailers and Towed Equipment ............... 12B-30
SAFE OPERATING PROCEDURES

Nuclear Density Inspection

Hazard Review

Lifting            Flying Particles            Moving Equipment
Slip, Trip and Fall Burns                  Propane
Radioactive Material            Heat Stress            Moving Traffic

Required Personal Protective Equipment (PPE)

Safety Shoes            Safety Vest            Gloves
Radiation Film Badge            Safety Glasses/Safety Goggles

1. Transport nuclear gauge in appropriate Type A labeled radioactive container. The gauge cannot be transported in the passenger compartment of a vehicle. The gauge must be transported in a secured waterproof compartment.
2. Bill of lading must be carried in the cab of the vehicle transporting the gauge.
3. A source certificate identifying the radioactive materials in the gauge must be kept with the gauge.
4. Emergency contact numbers and emergency procedures must be kept with the gauge.
5. Nuclear gauge must be stored in a secured area and must be labeled “radioactive material”.
6. Sign-out log must be kept in the nuclear gauge storage area.
7. Operator of the nuclear gauge must be certified to operate the nuclear gauge.
8. Operator shall be monitored for exposure to radiation. Film badge shall be worn at all times when transporting or working with the nuclear gauge.
9. Wear eye protection when driving pin for direct transmission rod.
10. Ensure that equipment operators and all concerned personnel on the job site are aware that a density test is being performed and the location of the density inspection on the job site. Use flasher, flag, cones, or drums to identify the location of the density gauge. Use a second person for a spotter if necessary.
11. Follow operation procedures and safety regulations established by Materials and Test Unit and the Radiation Protection Branch of the Department of Human Resources.

Related SOP’s

General SOPs..........................Chapter 10          Inspection of New Structures...............11B-46
Roadway Inspection..........................11B-69        Excavating, Trenching and Shoring..........11E-3
Density Inspection .............................11B-19
SAFE OPERATING PROCEDURES

Overhead and Cantilever Sign Maintenance

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**Required Personal Protective Equipment (PPE)**

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<tbody>
<tr>
<td>Safety Glasses/Safety Goggles</td>
<td>Gloves</td>
<td>Body Harness/Lanyard</td>
</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Avoid walking and working under suspended loads. Hard hats must be worn when working around backhoes, cranes, excavators, aerial devices, etc.
5. Proper lifting techniques shall be used. Get help or use equipment if necessary.
6. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
7. Locate all utilities in and near work site prior to excavating.
8. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
9. Routine maintenance should not be performed during peak traffic periods.
10. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

**Related SOP’s**

- General SOPs ...............................................Chapter 10
- Truck, Aerial Device ............................... 12A-26
- Hand Tools (Power and Manual) .............. 12B-13
SAFE OPERATING PROCEDURES

Pavement Marking Removal SOP 11B-56

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<td>Safety Glasses/Safety Goggles</td>
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</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
5. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
6. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Wear mask and goggles or safety glasses during operation.

Related SOP’s

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SAFE OPERATING PROCEDURES

Pile Driving

Hazard Review

Overhead Loads Confined Spaces Swinging Objects
Climbing Lifting Rigging
Moving Equipment Utilities Crushing

Required Personal Protective Equipment (PPE)

Safety Shoes Hard Hat Safety Vest
Safety Glasses/Safety Goggles Gloves Hearing Protection

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Avoid walking and working under suspended loads.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
6. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Be aware of escape routes in case of emergency.
8. Be aware of loose materials, excavation drop-off, tripping hazards and other obstructions.
9. Allow ample space for each employee to work safely.
10. Locate all utilities in and near work site prior to commencing work.
11. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
12. Keep walk spaces and work areas free from loose materials or tools.
13. Review MSDS for all hazardous materials being used or expected to be encountered.
14. Dispose of salvage materials properly, use gloves and long sleeves when handling treated timber, sheet piles or steel piles.
15. Be aware of pinch points and crushing hazards.
16. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
17. Employees should wash hands before eating, drinking or smoking.
18. Only one person shall be designated to communicate with the crane operator and shall review signals prior to commencing work.
19. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

Related SOP’s

General SOPs .............................................Chapter 10  Rigging .......................................................... 11E-9
Crane/Dragline .......................... 12A-4  Trailers and Towed Equipment ................. 12B-30
# Pipe Installation

## SAFE OPERATING PROCEDURES

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### Required Personal Protective Equipment (PPE)

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<td>Safety Vest</td>
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<td>Gloves</td>
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</table>

### 1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.

### 2. Determine the traffic control needs from the Work Zone Safety Handbook.

### 3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.

### 4. Evaluate site and follow “Excavating, Trenching and Shoring” Safe Operating Procedures.

### 5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.

### 6. Avoid walking and working under suspended loads. Wear hard hat when working around backhoes, cranes, excavators, etc.

### 7. Proper lifting techniques shall be used. Get help or use pipe hook, pry bar or other equipment as necessary.

### 8. Be aware of escape routes in case of emergency. It is a good practice to work facing oncoming traffic while on foot.

### 9. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.

### 10. Allow ample space for each employee to work safely.

### 11. Be aware of crushing hazards and pinch points when handling and jointing pipe.

### 12. Locate all utilities in and near work site prior to commencing work. Call ULOCO.

### 13. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.

### 14. Rubber boots may be needed in wet ditches.

### 15. Do not use any equipment that is unsafe.

### Related SOP’s

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Pipe/Culvert Maintenance – SOP 11B-59

SAFE OPERATING PROCEDURES

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Required Personal Protective Equipment (PPE)

<table>
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<tr>
<th>Equipment</th>
<th>Precautions</th>
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<tbody>
<tr>
<td>Safety Shoes</td>
<td>Safety Vest</td>
</tr>
<tr>
<td>Safety Glasses/Safety Goggles</td>
<td>Gloves</td>
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<tr>
<td>Safety Vest</td>
<td>Safety Glasses/Safety Goggles</td>
</tr>
<tr>
<td>Hard Hat</td>
<td>Safety Glasses/Safety Goggles</td>
</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: Provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Rubber boots are recommended when working in wet ditches.
5. Avoid walking and working under suspended loads.
6. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
7. Proper lifting techniques shall be used. Get help or use equipment if necessary.
8. Be aware of escape routes in case of emergency.
10. Allow ample space for each employee to work safely.
11. Locate all utilities in and near work site prior to excavating. Call ULOCO.
12. Watch for poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high top boots when hazards can not be avoided.
13. Keep walk spaces and work areas free of loose materials or tools.
14. Review MSDSs for all hazardous materials being used or expected to encounter.
15. Be aware of pinch points and crushing hazards.
16. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures. In hot weather, drink plenty of fluids.
17. Employees should wash hands before eating, drinking or smoking.

Related SOP’s

- General SOPs ........................................... Chapter 10
- Excavating, Trenching and Shoring ............... 11E-3
- Explosives ............................................. 11E-4
- Rigging ...................................................... 11E-9
- Crane/Dragline ........................................ 12A-4
- Tractor, Backhoe and Loader .......................... 12A-22
- Truck, Crew Cab and Flatbed ...................... 12A-29
- Compactor, Hand-Operated ............................ 12B-5
- Hand Tools (Power and Manual) ................... 12B-13
- Trailers and Towed Equipment ...................... 12B-30
SAFE OPERATING PROCEDURES

Placing Concrete

SOP 11B-60

Hazard Review

- Hazardous Material
- Parking
- Moving Traffic
- Overhead Loads
- Lifting
- Scaffolding
- Trench Collapse
- Confined Space
- Slip, Trip and Fall

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Shoes</th>
<th>Safety Vest</th>
<th>Hard Hat</th>
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<tbody>
<tr>
<td>Safety Glasses/Safety Goggles</td>
<td>Gloves</td>
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</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Avoid walking and working under suspended loads.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
6. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot.
8. Be aware of loose materials, excavation drop-off, tripping hazards and other obstructions.
9. Allow ample space for each employee to work safely.
10. Locate all utilities in and near work site prior to commencing work.
11. Be aware of poisonous plants, insects and snakes. Wear long sleeve shirts, gloves and high top boots when hazards can not be avoided.
12. Be alert to protruding nails, spikes or reinforcing bars in decks and rails.
13. Keep walk spaces and work areas free of loose materials or tools.
14. Review MSDSs for all hazardous materials being used or expected to encounter.
15. Dispose of salvage materials properly; use gloves and long-sleeved shirts when handling treated timbers.
16. Be aware of pinch points and crushing hazards.
17. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
18. Employees should wash hands before eating, drinking or smoking.

Related SOP’s

- General SOPs........................................Chapter 10
- Rigging.................................................11E-9
- Concrete Pump.....................................12B-7
- Hand Tools (Power and Manual).............12B-13
- Scaffolding........................................12B-23
SAFE OPERATING PROCEDURES

Planting and Plant Bed Maintenance

Hazard Review

Moving Traffic Moving Equipment Temperature Extremes
Poisonous Plants/Insects/Snakes Lifting Flying Particles
Overcrowding of Workers Uneven Ground Restricted-Use Chemicals
Animals

Required Personal Protective Equipment (PPE)

Safety Vest Safety Shoes Gloves
Safety Glasses/Safety Goggles

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
5. Proper lifting techniques shall be used. Get help or use equipment if necessary.
6. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot.
7. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
8. Allow ample space for each employee to work safely.
9. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
10. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
11. Watch for flying sand, fertilizer and mulch during seeding and mulching operation. Be aware of wind direction and try to work upwind. Eye protection should be worn.
12. When operating trucks and other equipment off of the roadway, be aware that there may be hidden objects in the grass and unstable terrain.
13. Read product labels, MSDS and pest control recommendation before handling pesticides. The documents are required to be at application site.
14. Before backing, make sure area is clear and use an observer when available.

Related SOP’s

General SOPs.......................................Chapter 10 Hazardous Waste Handling and Storage.......11E-5
Tractor, Wheel ............................................12A-25 Truck, Crew Cab and Flatbed.......................12A-29
Fumigation (Gassing) Rig...........................12B-11 Tractor Attachments.................................12B-29
Trailers and Towed Equipment.................12B-30
SAFE OPERATING PROCEDURES

Post-Tensioning Strand-Cutting and Removal SOP 11B-62

Hazard Review

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<th>Parking</th>
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<td>Scaffolding</td>
<td>Noise</td>
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Required Personal Protective Equipment (PPE)

<table>
<thead>
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<th>Hard Hat</th>
<th>Safety Glasses/Goggles</th>
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<tbody>
<tr>
<td>Safety Vest</td>
<td>Gloves</td>
<td>Face Shield</td>
</tr>
<tr>
<td>Body Harness/Lanyard</td>
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</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform operational checks.
2. Determine traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of vehicles.
4. Avoid walking and working under suspended loads.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
6. Clear the work area of personnel who are not performing the post-tensioning strand-cutting operation. Have these personnel stand out of any trajectory path of either end of the strand being cut. Ensure no bystanders are in the trajectory path of either end of the strand being cut.
7. Proper lifting techniques shall be used. Get help or use equipment if necessary.
8. Be aware of escape routes in case of emergency.
10. Allow ample space for each employee to work safely.
11. Locate all utilities in and near work site prior to commencing work.
12. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high top boots when hazards cannot be avoided.
13. Keep walk spaces and work areas free from loose materials or tools.
14. Review MSDS for all hazardous materials being used or expected to encounter.
15. Carefully chip away the concrete grout around the end of the strand. Do not stand in front of the strand while chipping away the group. Use the appropriate tools (hand chisels, hand drills, etc.) to chip away the concrete grout from around the strand end.
16. Observe safe operating procedures for welding and cutting.
17. Have a welder cut the strand end with a welding torch. The welder is to stand to the side of the strand while cutting. The welder is never to stand in front of the strand being cut.
18. Once the strand is cut, remove any strand remnants from the plastic conduit and prepare conduit for a new strand.
19. Dispose of salvage materials properly.
20. Be aware of pinch points and crushing hazards.
21. Take extra precautions to prevent heat and cold stress when working in extreme cold or hot temperatures.

22. Employees should wash hands before eating, drinking or smoking.

23. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

Related SOP’s

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<tr>
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</table>
SAFE OPERATING PROCEDURES

Post-Tensioning Strand Installation SOP 11B-63

Hazard Review

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Required Personal Protective Equipment (PPE)

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<th>Safety Vest</th>
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<tbody>
<tr>
<td>Safety Glasses</td>
<td>Welding Helmet/Goggles</td>
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</table>

1. Review Safe Operating Procedures for applicable equipment and perform operational checks.
2. Determine traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of vehicles.
4. Avoid walking and working under suspended loads.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
6. Clear the work area of personnel who are not performing the post-tensioning strand-cutting operation. Have these personnel stand out of any trajectory path of either end of the strand being cut. Ensure that no bystanders are in the trajectory path of either end of the strand being cut.
7. Proper lifting techniques shall be used. Get help or use equipment if necessary.
8. Be aware of escape routes in case of emergency.
10. Allow ample space for each employee to work safely.
11. Locate all utilities in and near work site prior to commencing work.
12. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high top boots when hazards cannot be avoided.
13. Keep walk spaces and work areas free from loose materials or tools.
14. Review MSDS for all hazardous materials being used or expected to encounter.
15. Grease new strand that is to be inserted into the plastic conduit. Grease shall not be applied in the areas of the recesses at the ends of the strands.
16. Place the greased strand into the plastic conduit and push the strand through the complete width of the bridge.
17. Install plates and strand vises at the ends of the strands at the recessed area.
18. Install the jacking equipment onto the strand and apply tension.
19. Cut the excess strand not under tension by using a torch or a comparable cutting device.
20. Seat the strand vise and remotely release by a hydraulic cable the tension applied by the jacking machine from the strand. Ensure that no personnel are standing in the trajectory path of the strand when the tension applied by the jacking machine is released.
21. Once the tension applied by the jacking machine is released, monitor the newly post-tensioned strand for 2 to 3 minutes before approaching the strand. This is to ensure that the tension load has properly transferred to the strand vise and plate assemblies.
22. Repack the recessed area around the post-tensioned strand ends with non-shrinking non-metallic grout.
23. Dispose of salvage materials properly.
24. Be aware of pinch points and crushing hazards.
25. Take extra precautions to prevent heat and cold stress when working in extreme cold or hot temperatures.
26. Employees should wash hands before eating, drinking or smoking.
27. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.
SAFE OPERATING PROCEDURES

Precast Box Culvert Installation SOP 11B-64

Hazard Review

Trench Collapse Moving Traffic Utilities Lifting Moving Equipment Overhead Loads Confined Space Slip, Trip and Fall

Required Personal Protective Equipment (PPE)

Safety Shoes Safety Vest Hard Hat
Safety Glasses Gloves

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: Provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; ad provide maximum protection for workers getting in and out of the vehicles.
4. Avoid walking and working under suspended loads. Hard hats must be worn when working around backhoes, cranes, excavators, etc.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
6. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Be aware of escape routes in case of emergency.
8. Be aware of loose materials, excavation drop-off, tripping hazards and other obstructions.
9. Allow ample space for each employee to work safely.
10. Locate all utilities in and near work site prior to commencing work.
11. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
12. Keep walk spaces and work areas free from loose materials or tools.
13. Review MSDS for all hazardous materials being used or expected to be encountered.
14. Dispose of salvage materials properly; use gloves and long sleeve shirts when handling treated timbers.
15. Be aware of pinch points and crushing hazards.
16. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
17. Employees should wash hands before eating, drinking or smoking.

Related SOP’s

General SOP’s.................................Chapter 10 Excavating, Trenching and Shoring............11E-3
Explosives.............................................11E-4 Rigging..............................................11E-9
Crane/Dragnet.................................12A-4 Truck, Crew Cab and Flatbed...............12A-29
Compactor, Hand-Operated...............12B-5 Hand Tools (Power and Manual).............12B-13
Trailers and Towed Equipment...........12B-30
SAFE OPERATING PROCEDURES

Raised Pavement Marker Installation/Maintenance

Hazard Review

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<tbody>
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<td>Heat and Cold Stress</td>
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Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Safety Shoes</td>
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<tr>
<td>Safety Vest</td>
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<tr>
<td>Safety Glasses</td>
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</table>

Gloves

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Use caution when handling hot/flammable materials. Review MSDS for each material used.
5. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
6. Utilize all components of the installation train when placing or replacing markers.
7. Avoid operation during peak traffic periods.

Related SOP’s

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Raised Pavement Marker Installation/Maintenance – SOP 11B-65
SAFE OPERATING PROCEDURES

Rest Area Maintenance

SOP 11B-66

Hazard Review

<table>
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<th>Caustic Cleaning Agents</th>
<th>Poisonous Plants/Insects/Snakes</th>
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Required Personal Protective Equipment (PPE)

<table>
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<tr>
<th>Safety Shoes</th>
<th>Safety Vest</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
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</tbody>
</table>

1. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
2. Be aware of loose or slippery materials, tripping hazards and other obstructions. Take appropriate measures to eliminate them.
3. Place tools in safe position so that sharp points are not exposed.
4. Be aware that there may be hidden obstructions with sharp edges and broken glass especially in grassy areas.
5. Use caution when handling trash bags containing broken or sharp objects.
6. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Review product labels and MSDS before using any caustic cleaning or sanitizing chemicals.
8. Keep sidewalks and floors free from obstructions and ice and snow during inclement weather. Place appropriate warning signs when mopping or waxing floors.

Related SOP’s

General SOPs ...........................................Chapter 10
Lawn Mower .............................................12A-9
Tractor, Wheel .................................12A-25
Hand Tools (Power and Manual) ...........12B-13
Tractor Attachments ............................12B-28
# Safe Operating Procedures

## Rip Rap Installation/Removal

### Hazard Review

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<tr>
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### Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Equipment</th>
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<tbody>
<tr>
<td>Safety Shoes</td>
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<tr>
<td>Safety Vest</td>
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<tr>
<td>Safety Glasses</td>
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</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Hand, respiratory and eye protection may be required.
5. Be aware of escape routes in case of emergency. It is a good practice to work facing oncoming traffic while on foot.
6. Use proper lifting technique when moving rip rap. Get help if stones are too heavy.
7. Use gloves and handle carefully to avoid mashing fingers.
8. Watch for tripping hazards and slippery footing.
9. Allow ample space for each employee to work safely.
10. Employees on foot should stay out of the way of operating equipment until the area is clear for hand work.
11. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high top boots when hazards cannot be avoided.
12. Watch for flying dust and fine particles when handling rip rap. Be aware of the wind direction and try to work upwind. Use eye protection when needed.
13. Rubber boots may be needed in wet ditches.

### Related SOP’s

- General SOPs ........................................ Chapter 10
- Excavator, Hydraulic ................................. 12A-5
- Loader, Front End .................................... 12A-11
- Tractor, Backhoe and Loader .......................... 12A-22
- Truck, Crew Cab and Flatbed .......................... 12A-29
- Truck, Dump ............................................. 12A-30
- Trailers and Towed Equipment .......................... 12B-30
SAFE OPERATING PROCEDURES

Roadside Equipment Repair SOP 11B-68

Hazard Review

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Required Personal Protective Equipment (PPE)

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<tr>
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<tr>
<td>Safety Glasses/Goggles</td>
</tr>
<tr>
<td>Gloves</td>
</tr>
</tbody>
</table>

1. Use safe driving techniques when pulling off the road, parking off the road and pulling back onto the road.
2. Use proper warning markers appropriate for daylight or darkness when parked to work on vehicles or equipment.
3. Proper lifting techniques should be used. Get help or use equipment if necessary.
4. Always use the proper tools for the job.
5. Always park as far as possible away from traffic.
6. Be certain jacks and hoisting equipment are rated for the loads being lifted.
7. Use proper jacking and hoisting procedures.
8. Take caution to avoid hot surfaces, liquids and materials.
9. Use proper precautions when working with equipment subject to high pressure such as radiators, tires, hydraulic systems and batteries.
10. Use proper safety precautions to avoid explosive, chemical injuries when working with or near batteries. Wear eye protection.
11. Ascertain the stability of equipment being repaired and the service vehicles when stopped on the road or off the road, particularly on uneven terrain.
12. Clean up gasoline, oils or detergents that may present fire or other safety hazards.
13. Ensure that first aid kits and fire extinguishers are readily available and in good condition.
14. Disable starting circuits or procedures systems when working around engines or other equipment moving parts to prevent inadvertent equipment or accessory movement.

Related SOP’s

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<th>SOP Title</th>
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</tr>
</tbody>
</table>
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SAFE OPERATING PROCEDURES

Roadway Inspection

Hazard Review

<table>
<thead>
<tr>
<th>Poisonous Plants, Insects and Snakes</th>
<th>Parking</th>
<th>Moving Equipment</th>
</tr>
</thead>
<tbody>
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<tr>
<td>Moving Traffic</td>
<td>Concrete MSDS/Cautions</td>
<td>Extreme Temperatures</td>
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<tr>
<td>Animals</td>
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</tbody>
</table>

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Shoes</th>
<th>Safety Vest</th>
<th>Safety Glasses/Goggles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Check to ensure that signing and traffic control is in accordance with project traffic control plans.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicle and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. When extracting concrete cylinders from molds at Material and Test labs, use proper eye wear.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment. Stay alert to equipment movement.
6. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions. Newly seeded areas are especially hazardous.
8. Be aware of guidelines for proper trenching and excavation. Do not enter areas inadequately protected from cave-ins.
9. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
10. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot.
11. Use caution when handling hot/flammable materials. Review MSDS for each material used.
12. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperature.
13. Inspect contractor’s equipment periodically for required back up alarms.
14. When performing inspection duties, note the location and proximity of construction equipment. Avoid working in the blind spots of construction equipment. If inspections must be performed in equipment blind spots, advise the equipment operator of your presence and stay alert to your surroundings.
## Related SOP’s

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<th>11B-2</th>
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SAFE OPERATING PROCEDURES

Roadway Lighting Installation/Maintenance  

Hazard Review

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<th>Lifting</th>
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</thead>
<tbody>
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<td>Electrical Power</td>
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</tbody>
</table>

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Shoes</th>
<th>Safety Vest</th>
<th>Safety Glasses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
<td>Body Harness/Lanyard</td>
<td>Hard Hat</td>
</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Avoid walking and working under suspended loads. Hard hats must be worn when working around backhoes, cranes, excavators, aerial devices, etc.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
6. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Be aware of escape routes in case of emergency.
8. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstruction.
9. Locate all utilities in and near work site prior to excavating.
10. Take extra precautions to prevent heat and cold stress when working in extremely hot and cold temperatures.
11. Use established safety procedures when working around electrical lines and connections.
12. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

Related SOP’s

<table>
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Roadway Lighting Installation/Maintenance and Inspection – SOP 11B-70
SAFE OPERATING PROCEDURES

Sampling and Inspection at SOP 11B-71
Producer’s Facility

Hazard Review

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<td>Flying Particles</td>
<td>Slip, Trip and Fall</td>
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<td>Fumes</td>
<td>Cuts</td>
</tr>
</tbody>
</table>

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Shoes</th>
<th>Hard Hat</th>
<th>Safety Vest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Glasses</td>
<td>Hearing Protection</td>
<td>Respirator</td>
</tr>
</tbody>
</table>

1. Use proper lifting techniques.
2. Wear safety shoes or boots at all times. Wear hard hats, safety vests, safety glasses, hearing protection and breathing protection as required by Personal Protective Equipment policy or producer’s policy, whichever is more stringent.
3. Review and follow producer’s safety procedures.
4. Be aware of moving equipment and moving parts on machinery. Be alert at all times.
5. Be aware of uneven and/or slippery surfaces.
6. Operate all hand and power tools properly. Be sure all guards and shields are in place.
7. Be aware of sharp edges on materials.
8. Be aware of hot surfaces associated with welding.
9. Avoid work under or adjacent to suspended loads.

Related SOP’s

- General SOPs ...........................................Chapter 10
- Welding, Arc .........................................11A-39
- Roadway Inspection .......................11B-69
- Welding, Oxy-Acetylene Cutting/ ...................11A-40
- Borrow Pit, Waste Pit and .......................11B-8
- Stockpiling Operations
SAFE OPERATING PROCEDURES

Seeding, Mulching and Top Dressing SOP 11B-72

Hazard Review

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<th>Moving Equipment</th>
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<td>Animals</td>
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<td></td>
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</tbody>
</table>

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Shoes</th>
<th>Safety Vest</th>
<th>Safety Glasses/Goggles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
<td></td>
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</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with operator before approaching equipment.
5. Proper lifting techniques shall be used. Get help or use equipment if necessary.
6. Be aware of escape routes in case of emergency. It is a good practice to face oncoming traffic while on foot.
7. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
8. Allow ample space for each employee to work safely.
9. Use caution when handling hot/flammable materials. Review MSDS for each material used.
10. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
11. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.
12. Watch for flying sand, fertilizer and mulch during seeding and mulching operation. Be aware of wind direction and try to work upwind. Eye protection should be worn.
13. Keep fire extinguishers available at all times when using a fixed kettle.
14. When operating trucks and other equipment off of the roadway, be aware that there may be hidden objects in the grass and unstable terrain.
15. Before backing make sure area is clear and use an observer when available.

Related SOP’s

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<thead>
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<th>Chapter 10</th>
<th>Asphalt Distributor/Kettle</th>
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Sign Installation/Maintenance SOP 11B-73
Including Delineators

Hazard Review

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<td>Overhead Objects</td>
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</table>

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Shoes</th>
<th>Safety Glasses/Goggles</th>
<th>Safety Vest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearing Protection</td>
<td>Hard Hats</td>
<td>Gloves</td>
</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work areas; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Proper lifting techniques shall be used. Get help or use equipment if necessary.
5. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
6. Where evidence of underground utilities exists at the proposed sign location, have utilities located prior to installing post.
7. Wear gloves and safety goggles when driving posts.
8. Use sledgehammer for driving only when posts are too short to drive with post driver.
9. Use hearing protection when operating post driver.
10. Hard hats shall be worn when working with overhead objects such as cranes, signs, etc.

Related SOP’s

<table>
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Special Markings Installation

SOP 11B-74

Hazard Review

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<td>High Air Pressure</td>
<td>Blowing Fines (Glass beads and dust)</td>
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</tbody>
</table>

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Shoes</th>
<th>Safety Vest</th>
<th>Safety Glasses/Goggles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
<td>Protective Clothing</td>
<td></td>
</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
5. Use caution when handling hot/flammable materials. Review MSDSs for each material used.
6. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
7. Beware of ticks during summer months.
8. Wear gloves when handling metal stencils.
9. Wear protective clothing when handling hot thermoplastic materials (long sleeves).

Related SOP’s

- General SOPs.................................................Chapter 10 Paint Machine, Centerline...............................12A-12
- Truck, Crew Cab and Flatbed.......................12A-29 Air Compressor.....................................................12B-1
SAFE OPERATING PROCEDURES

Steel Plank Floor Maintenance  SOP 11B-75

Hazard Review

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</table>

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>PPE</th>
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</thead>
<tbody>
<tr>
<td>Safety Vest</td>
</tr>
<tr>
<td>Safety Shoes</td>
</tr>
<tr>
<td>Hard Hat</td>
</tr>
<tr>
<td>Gloves</td>
</tr>
<tr>
<td>Safety Glasses/Goggles/Face Shield</td>
</tr>
<tr>
<td>Hearing Protection</td>
</tr>
</tbody>
</table>


1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Avoid walking and working under suspended loads.
5. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
6. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Be aware of escape routes in case of emergency.
8. Be aware of loose materials, tripping hazards and other obstructions.
9. Allow ample space for each employee to work safely.
10. Locate all utilities in and near work site prior to commencing work.
11. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high top boots when hazards can not be avoided.
12. Be alert to protruding nails or spikes in decks and rails.
13. Keep walk spaces and work areas free of loose materials or tools.
14. Review the MSDS for all hazardous materials being used or expected to encounter.
15. Dispose of salvage materials properly; use gloves and long-sleeved shirts when handling creosote timbers.
16. Be aware of pinch points and crushing hazards.
17. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
18. Employees should wash hands before eating, drinking or smoking.
19. Observe safe operating procedures for welding and cutting.
20. Be aware that repetitive bending while using stud gun fastener can cause back and knee strain.

Related SOP’s

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<th>Chapter/Rev</th>
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SAFE OPERATING PROCEDURES

Structural Steel Cleaning

**Hazard Review**

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</table>

**Required Personal Protective Equipment (PPE)**

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<tr>
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<tbody>
<tr>
<td>Hearing Protection</td>
<td>Safety Glasses/Goggles</td>
<td>Face Shield</td>
</tr>
<tr>
<td>Respirator</td>
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</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Avoid walking and working under suspended loads.
5. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Allow ample space for each employee to work safely.
8. Locate all utilities in and near work site prior to commencing work.
9. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high top boots when hazards can not be avoided.
10. Keep walk spaces and work areas free of loose materials or tools.
11. Review the MSDS of all hazardous materials being used or expected to encounter.
12. If working in a confined space, provide forced ventilation or use other measures to ensure good air quality.
13. If red lead is encountered while sandblasting, stop work immediately and consult Supervisor.
14. If red lead is encountered while power tooling, approved respiratory equipment and protective clothing shall be issued before work commences. All red lead shall be contained at the job site.
15. Do not clean hands with pressurized air.
16. Take extra precautions to prevent heat or cold stress when working in extremely hot or cold temperatures.
17. Employees should wash hands before eating, drinking or smoking.

**Related SOP’s**

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**SAFE OPERATING PROCEDURES**

**Structural Steel Fabrication**

**SOP 11B-77**

### Hazard Review

- Toxic Chemicals
- Lifting
- Moving Traffic
- Scaffolding
- Utilities
- Noise
- Slip, Trip and Fall

### Required Personal Protective Equipment (PPE)

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<td>Torch cutting glasses</td>
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<tr>
<td>Hearing Protection</td>
<td>Safety Glasses</td>
</tr>
<tr>
<td></td>
<td>Body Harness/Lanyard</td>
</tr>
<tr>
<td>Work zone vest</td>
<td>Leather gloves</td>
</tr>
<tr>
<td></td>
<td>Leather coat or sleeves</td>
</tr>
</tbody>
</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Proper lifting techniques shall be used. Get help or use equipment if necessary.
5. Be aware of loose materials, tripping hazards and other obstructions.
6. Allow ample space for each employee to work safely.
7. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high top boots when hazards can not be avoided.
8. Keep walk spaces and work areas free of loose materials or tools.
9. Employees should be aware of the hazardous fumes created by welding and cutting.
10. If working in a confined space, provide forced ventilation or other means to provide good air quality.
11. Review safe operating procedures for welding and cutting.
12. Avoid handling steel with bare hands. Steel could be hot from welding or cutting and steel slivers from drilling or other power tool cutting could puncture the skin.
13. Employees should wash hands before eating, drinking or smoking.
14. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

### Related SOP’s

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SAFE OPERATING PROCEDURES

Structural Steel Painting  

Hazard Review

Toxic Chemicals  Lifting  Moving Traffic  
Scaffolding  Utilities  Noise  
Slip, Trip and Fall

Required Personal Protective Equipment (PPE)

| Hard Hat | Safety Shoes | Safety Vest |  
| Rubber Gloves | Body Harness/Lanyard | Safety Glasses |

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.
5. Avoid walking and working under suspended loads.
6. Proper lifting techniques shall be used. Get help or use equipment if necessary.
7. Be aware of loose materials, tripping hazards and other obstructions.
8. Allow ample space for each employee to work safely.
9. Locate all utilities in and near work site prior to commencing work.
10. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high top boots when hazards can not be avoided.
11. Be alert to protruding nails or spikes in decks and rails.
12. Keep walk spaces and work areas free of loose materials or tools.
13. Review the MSDS for all hazardous materials being used or expected to encounter.
14. If working in a confined space, provide forced ventilation or use other measures to ensure good air quality.
15. Do not clean hands with pressurized air.
16. Take extra precautions to prevent heat and cold stress when working around extremely hot or cold temperatures.
17. Employees should wash hands before eating, drinking or smoking.

Related SOP’s

<table>
<thead>
<tr>
<th>General SOPs</th>
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Structural Steel Painting Activities and Inspection – SOP 11B-78
SAFE OPERATING PROCEDURES

Timber Bridge Floor Maintenance

Hazard Review

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Required Personal Protective Equipment (PPE)

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1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.
5. Avoid walking and working under suspended loads.
6. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
7. Proper lifting techniques shall be used. Get help or use equipment if necessary.
8. Be aware of escape routes in case of emergency.
10. Allow ample space for each employee to work safely.
11. Locate all utilities in and near work site prior to excavating.
12. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high top boots when hazards can not be avoided.
13. Be alert to protruding nails or spikes in decks and rails.
14. Keep walk spaces and work areas free of loose materials or tools.
15. Review MSDSs for all hazardous materials being used or expected to encounter.
16. Dispose of salvage materials properly, use gloves and long-sleeved shirts when handling treated timbers.
17. Be aware of pinch points and crushing hazards.
18. Take extra precautions to prevent heat and cold stress when working around hot or cold temperatures.
19. Employees should wash hands before eating, drinking or smoking.

Related SOP’s

General SOPs ........................................... Chapter 10  Hoisting/Jacking .................................11A-9
Rigging ........................................... 11E-9  Truck, Crew Cab and Flatbed ..........................12A-29
Air Compressor ................................. 12B-1  Hand Tools (Power and Manual) .....................12B-13
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SAFE OPERATING PROCEDURES

Timber Bridge Super/Sub Structure Maintenance

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Required Personal Protective Equipment (PPE)

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<tr>
<td>Safety Glasses</td>
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</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
4. Avoid walking and working under suspended loads.
5. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.
6. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
7. Proper lifting techniques shall be used. Get help or use equipment if necessary.
8. Be aware of escape routes in case of emergency.
10. Allow ample space for each employee to work safely.
11. Locate all utilities in and near work site prior to commencing work.
12. Be aware of poisonous plants, insects and snakes. It is a good practice to wear long sleeve shirts, gloves and high top boots when hazards can not be avoided.
13. Be alert to protruding nails or spikes in decks and rails.
14. Keep walk spaces and work areas free of loose materials or tools.
15. Review MSDSs for all hazardous materials being used or expected to encounter.
16. Dispose of salvage materials properly; use gloves and wear long-sleeved shirt when handling treated timbers.
17. Be aware of pinch points and crushing hazards.
18. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
19. Employees should wash hands before eating, drinking or smoking.
Related SOP’s

General SOPs ......................................Chapter 10  Hoisting/Jacking ............................................11A-9
Rigging .............................................. 11E-9  Truck, Crew Cab and Flatbed .......................12A-29
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SAFE OPERATING PROCEDURES

Towing Disabled Equipment  SOP 11B-81

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Required Personal Protective Equipment (PPE)

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<tr>
<td>Hard Hat</td>
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</table>

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks. Make sure all emergency and warning lights are working.
2. If available, consult operator's manual for proper towing equipment, methods and procedures, otherwise, seek assistance from trained, qualified personnel.
3. No personnel shall be allowed to ride in the towed vehicle except when necessary for steering and/or braking.
4. When towing disabled equipment during winter storms or other inclement weather, adjust operating speed with the changing conditions.
5. Operators and passengers in the towing vehicle shall wear seat belts and shoulder harness as provided.
6. Stay clear of all moving parts, belts, pulleys, machinery, winches, cables, chains, etc.
7. Use proper backing techniques.
8. Be aware of backlash from broken cables and chains.
9. Be certain the towing apparatus is securely hooked to the frame, chassis or member.
10. Use safety chains.
11. Be aware of escape routes.
12. Avoid overloading and sudden jerks.

Related SOP’s

| General SOPs.................................Chapter 10 | Hoisting/Jacking ..........................................11A-9 |
| Mechanic Operations ........................11A-22 | Rigging............................................................11E-9 |
| Trailers and Towed Equipment.............12B-30 |
SAFE OPERATING PROCEDURES

Traffic Signal Installation/Maintenance  

Hazard Review

Moving Traffic  Slip, Trip and Fall  Lifting Heavy Objects  
Confined Space  Hand-Operated Power Equipment  Sun Exposure  
High Voltage Power Lines  Overhead Objects

Required Personal Protective Equipment (PPE)

Safety Shoes  Body Harness/Lanyard  Hard Hats  
Insulated Gloves  Safety Vest  Safety Glasses

1. Use established safety procedures when working around electrical lines and connections.
2. Perform no modification to lift equipment that may diminish hazard protection.
3. Wear body harness and lanyard when in elevated position in bucket truck.
4. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.
5. Chock wheels and engage braking system before operating aerial lift device.
6. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
7. Determine the traffic control needs from the Work Zone Safety Handbook.
8. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
9. Insulated gloves may be used when working around high voltage lines.
10. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
11. Avoid walking and working under suspended loads. Hard hats are required.
12. All ground personnel shall wear hard hats while aerial devices are in use.

Related SOP’s

General SOPs ...........................................Chapter 10  Truck, Aerial Device .............................................12A-26  
Concrete Saw ................................................ 12B-8  Hand Tools (Power and Manual) ..........................12B-13  
Trailers and Towed Equipment ...................12B-30  Trenching Machine .................................12B-31
SAFE OPERATING PROCEDURES

Traffic Survey Equipment/Maintenance

Hazard Review

Moving Traffic  Slip, Trip and Fall  Confined Space
Flying Particles  Poisonous Plants, Snakes and Insects  Sun Exposure
Temperature Extremes  Lifting  Backing

Required Personal Protective Equipment (PPE)

Safety Shoes  Safety Vest  Safety Glasses
Hard Hat (see item #9)

1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Determine the traffic control needs from the Work Zone Safety Handbook.
3. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicle.
4. Safety shoes, safety glasses and vests are standard required equipment.
5. Be aware of poisonous plants, snakes and insects. It is a good practice to wear long sleeve shirts, gloves and high top boots when the hazard cannot be avoided. Barrier creams and sunblock are available from Inventory and should be used.
6. Take extra precautions to prevent heat and cold stress when working hot or cold temperatures.
7. Employees should wash hands before eating, drinking, or smoking.
8. Be aware of flying sand, dust or other debris when blowing out cracks with compressed air. Vehicles driving by the work area will also generate flying debris. Eye protection (safety glasses) must be worn. Be aware of wind direction and try to work upwind.
9. A hard hat (safety helmet) may be required if exposed to falling or flying objects as determined by a work site hazard assessment.
10. Take extra precautions not to block driveways sight distances with signing.

Related SOP’s

General SOPs.................................Chapter 10  Ladder .......................................................... 12B-15
Hand Tools (Power and Manual).......... 12B-13  Hand Removal of Vegetation......................... 11B-42
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SAFE OPERATING PROCEDURES

Tree Felling

Hazard Review

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<tr>
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1. Each work location where tree felling is to be done shall be under the direction of a person trained and qualified in tree felling.

2. Supervisors will ensure that employee has received training on chain saw and tree felling prior to allowing operation to proceed.

3. Hard hat, eye and/or face protection, hearing protection and safety shoes are required when using a chain saw. Chain saw chaps shall also be used.

4. Be aware of poisonous plants, insects, snakes, animals, and animal waste products and carcasses. It is a good practice to wear long sleeve shirts, gloves and high-top boots when hazards cannot be avoided.

5. Before felling any tree the following should be considered:
   - Shape of the tree
   - Wind force and direction
   - Location of overhead utilities
   - Extra stress from ice, vines, etc.
   - Lean of the tree
   - Decayed, hollow or other weak spots
   - Location of other workers and equipment
   - Traffic or any other things that may cause trouble when the tree falls.

6. The work area should be cleared and an escape route planned before any cutting is started.

7. Each employee involved in the felling shall be instructed exactly what to do. All workers not involved in the operation should keep clear of the work area (at least two tree lengths).

8. Chain saws shall be started on the ground at least 10 feet from the refueling area. Drop starting of chain saws is strictly prohibited.

9. A notch or backcut should be used in felling trees over ten inches measured at belt height. No tree shall be felled by ripping or slicing cuts. Prior to making a backcut, the direction of fall shall be re-evaluated.

10. The depth or penetration of the notch should be about one-third the diameter of the tree.

11. The opening or height of the notch should be about 2 1/2 inches for each foot of the tree’s diameter.

12. The backcut shall be made higher than the point of the notch to prevent kickback.

Tree Felling – SOP 11B-84
12. An audible warning must be given when the tree is ready to fall. Feller must shut off saw before retreat.
13. If there is danger from the tree falling in the wrong direction, wedges, block and tackles, rope or wire cable shall be used. Wire cable should not be used when there are electrical hazards present. All limbs shall be removed from trees to a height and width sufficient to allow the tree to fall clear of any wires and other objects in the vicinity.
14. Extra caution should be used when trees are rotten, split, hollow or frozen because they may fall in an unexpected direction even though the cut is made on the proper side.
15. Keep clear of the butt of the tree when it starts to fall.
16. Multiple cutting on the same felled tree should be avoided. Be aware of others working in the area. Limbs often roll/move during cutting and removal.
17. Worker must not approach a feller closer than twice the height of the tree until eye contact with the feller has been established.

Related SOP’s

General SOPs.............................................Chapter 10 Hand Removal of Vegetation.......................11B-42
Truck, Crew Cab and Flatbed.....................12A-29 Brush Chipper..............................................12B-3
Chain Saw and All-Purpose Cut-Off Saw.....12B-4
SAFE OPERATING PROCEDURES

Tug Operations

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1. Eye protection shall be worn when sanding, scraping or working on batteries. Hearing protection shall be worn in designated areas. Personal Flotation Devices shall be worn when working in areas where slips, trips, or falls would likely result in falling overboard. Gloves are required when handling wire rope.
2. Be aware of loose objects, slippery decks, tripping hazards, uneven deck coamings, “headbangers”, and other obstructions. Always use handrails when ascending or descending ladders.
3. Proper lifting techniques shall be used. Get help or use lifting equipment if necessary.
4. Always stand on rubber padding when working around distribution panels.
5. Confined spaces must be well ventilated prior to entry. Never enter a confined space without a standby observer.
6. Never leave doors ajar. Doors should be securely closed or hooked in the opened position. Be mindful of stress on doors due to either created vacuum or high wind.
7. Ensure shore connections are de-energized before connecting shore power. Before using portable power tools, inspect for frayed or cut wiring, loose connections and proper grounding.
8. Ensure towing bridles are properly secured. Never stand in the bight of a line. Stand well clear of tow lines that are under strain.
9. If a fire fighting or rescue operation is required, remember the limitations of your training and take no unnecessary risks.
10. Be alert for falling or shifting objects during heavy weather conditions.
11. Be aware of fire extinguishers, alarm and hose locations. Check routinely to make sure they are working properly. Follow good housekeeping practices to reduce the risk of fires.
12. Take extra precautions to prevent heat and cold stress.

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SAFE OPERATING PROCEDURES

Underwater Inspection and Maintenance SOP 11B-86

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1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
3. Determine the traffic control needs from the Work Zone Safety Handbook.
4. Park in areas that: provide safe entrance/exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
5. Standard diving personal protective equipment is required as per OSHA. Use additional equipment as required by each activity.
6. Avoid walking and working under suspended loads. Hard hats must be worn when working around backhoes, cranes, excavators, etc.
7. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
8. Proper lifting techniques shall be used. Get help or use equipment if necessary.
11. Allow ample space for each employee to work safely.
12. Locate all utilities in and near work site prior to commencing work.
14. Watch for protruding reinforcing steel, nails, rusted steel members, submerged drift, cut off piles, old false work and other obstructions. Keep walk spaces and work areas free of loose materials or tools.
15. Review MSDSs for all hazardous materials being used or expected to encounter.
16. Be aware of pinch points and crushing hazards.
17. Take extra precautions to prevent heat or cold stress when working in extremely hot or cold temperatures.
18. Be aware of water conditions that require additional precautions such as high water velocity, pollution, low visibility, boat traffic and fishing lines.
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Traffic Signal Cabinet Work

SOP # 11B-87

Hazard Review

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Required Personal Protective Equipment (PPE)

(Based on job specific hazard review)

| Safety Vest | Safety Toe Shoes |

1. Follow all manufacturers’ guidelines.
2. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
3. Park in areas that provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; and provide maximum protection for workers getting in and out of vehicles.
4. Use flashers when parking in right of way or side of road. Use strobe light as deemed necessary to supplement emergency flashers.
5. Wear appropriate personal protective equipment consistent with the hazard or deemed necessary by Supervisor. Safety vest must be worn at all times when working outside vehicle.
6. Use extreme caution to stay clear of moving traffic when on foot; avoid walking and working under suspended loads; and face traffic when walking.
7. Be aware of escape routes in case of emergency.
8. Conduct tailgate meeting when two or more employees are working together. Review plans to determine electrical hazards prior to entering work site.
9. Use proper tools for work required.
10. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
11. Be aware of loose material, tripping hazards, uneven ground and other obstructions.
13. Allow ample space for each employee to work safely.

Related SOP’s

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Field Data Collection Safety/Horizontal Curves SOP 11B-88

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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<td>Safety glasses</td>
<td>Vehicle strobes/flashers</td>
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<tr>
<td>Hard hat</td>
<td>Insect repellant</td>
<td>Poisonous plant protection</td>
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</table>

1. Before going to the work site:
   a. Ensure traffic control devices, strobes, flashers, etc., are working and in good condition.
   b. Ensure hand tools are in good condition.
   c. Ensure required personal protective equipment (PPE) is in good condition – workers exposed to falling objects must wear a hard hat.

2. Vehicles should be parked on the same side of the road in areas that:
   a. Provide maximum protection for workers getting in and out of vehicles.
   b. Provide safe entrances and exits to the work site.
   c. Prevent potential conflicts with vehicles traveling on the roadway.

3. Consider driver perspectives, lines of sight, and driveways when parking vehicles and placing signs.

4. A minimum of two workers should be available at any given site so at least one can act as a lookout/spotter for oncoming traffic.

5. Portable warning signs are encouraged, if available.

6. Workers should use pliers to hold and position nails.

7. Workers should work facing traffic as much as possible.

8. Workers should face traffic when traveling on foot.

9. Workers should be alert to work site hazards and identify appropriate escape routes.

10. Workers should be alert to wide or oversized loads traveling through work sites.

11. If possible, avoid working during peak hours on high volume traffic routes.

12. Do not leave equipment (tripods, etc.) unattended when positioned in/adjacent to travel way.

13. Remove any traffic control devices in a manner that provides workers with the most protection.

Related SOPs

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SAFE OPERATING PROCEDURES

Behind the Wheel Training of School Bus Drivers

Hazard Review

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Required Personal Protective Equipment (PPE)

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<th>Equipment</th>
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<tr>
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<td>Gloves</td>
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<tr>
<td>Safety Glasses</td>
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</table>

1. Always make sure the trainee can comprehend essential basic instructions or commands of the Education Specialist before beginning the road test.
2. Perform pre-operational checks on equipment making sure engine is off before beginning inspection. Wear gloves and eye protection when checking engine fluids. Use stepladder to access the engine compartment to avoid climbing onto the vehicle.
3. Do not stand directly in front of or behind the bus during the inspection. Safety vest shall be worn when conducting pre-operational checks outside the vehicle.
4. Use proper lifting techniques when opening hood of vehicle.
5. When looking under the bus, crouch with one knee down rather than bending at the waist.
6. Prior to testing, give clear preliminary instructions. Stand out of the direct line of the bus. Establish eye contact with the driver before approaching the vehicle.
7. Observe trainee closely and constantly monitor traffic around the bus. Be alert for inattentive drivers.
8. Remain in area where the traffic complexity is within the ability of the driver. Be sure to consider his experience and confidence, moving to more demanding or dangerous area only when driver is fully prepared.
9. If the Driver Education Specialist observes a trainee action that could result in an auto accident, the Specialist will immediately provide corrective commands to the trainee.
10. Use handrail when getting on or off the bus. (Use 3 pt. Mount/dismount)
11. Sit at left edge of seat at angle to driver with both feet on floor.
12. When parking for long periods of time, air brake pressure must be reduced to the lockup point.
13. Remove key from unattended vehicle.
14. All personnel to vacate bus when refueling. Do not over fill fuel tank.

Related SOP’s

General SOPs ................................ Chapter 10
# SAFE OPERATING PROCEDURES

## Commercial Vehicles Examination and Road Test

### Hazard Review

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### Required Personal Protective Equipment (PPE)

- Safety Vest

1. Ensure that client can comprehend essential basic instructions or commands of the Examiner before beginning the road test.
2. If Examiner identifies an obvious lack of experience in operation, a learner’s permit shall be issued in lieu of conducting a road test.
3. With engine off, perform pre-operational checks of equipment verifying that parking brake is set and gear shift is in park position. Always conduct inspection in a safe, low traffic area. Never stand directly in front of or to the rear of the client’s vehicle. Examiner shall wear a safety vest while the client is performing the pre-operational check and skills portion of the exam and while outside the client’s vehicle.
4. When looking under vehicles, crouch with one knee down rather than bending at waist.
5. Always use a 3-point mount and dismount when climbing on or off vehicles.
6. A seat belt is required to be worn by the Examiner in all vehicles. If the seat belt is malfunctioning, broken, or missing, the Examiner shall not conduct a road test in that vehicle.
7. Maintain a calm demeanor and issue simple, crisp instructions throughout the course of the road test.
8. Examiners should observe driver’s gear selection and look to the rear while the client is performing backing maneuvers. Note: Many road test accidents occur while clients are parking or backing in the parking lot.
9. Observe the client closely and constantly monitor traffic conditions. Be alert for inattentive drivers. During the course of the road test, if the Examiner determines that the client is inept/unsafe, the client should be instructed to pull to the side of the road and the test should be terminated.
10. If the Examiner observes a client action that could result in a vehicle accident, the Examiner should immediately warn the driver to take corrective action.
11. Use proper lifting techniques when moving objects such as cones, boxes or other objects.

### Related SOP’s

- General SOPs: Chapter 10

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Commercial Vehicles Examination and Road Test – SOP 11C-2
SAFE OPERATING PROCEDURES

Investigations

**Hazard Review**

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**Required Personal Protective Equipment (PPE)**

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<tr>
<td>Safety Vest</td>
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</table>

1. Perform a Hazard Risk Assessment. Be observant; check traffic and location before stopping vehicle.
2. Fluorescent vest shall be worn when conducting an inspection adjacent to the travel portion of the road or where moving vehicles are a threat.
3. Where hazardous materials are involved, policies regarding radioactive materials and nuclear devices, toxic chemical spills and/or rupture of natural gas pipelines should be strictly adhered to.
4. Use extreme caution when walking in salvage yards. Be aware of slip, trip and foot puncture hazards.
5. Block or support vehicles before working underneath. Head protection, such as a bump cap shall be worn while conducting inspections on the underside of vehicles.
6. Use a 3-point mount and dismount when climbing on or off vehicles.
7. Use proper lifting techniques when moving objects.
8. When looking under vehicles, crouch with one knee down rather than bending at the waist.
9. Beware of poisonous plants, snakes and insects, as well as vicious animals.
10. Follow proper high-risk arrest procedures.

**Related SOP’s**

General SOPs ................................ Chapter 10
Non-Commercial Vehicles Examination and Road Test

**Hazard Review**

- Moving Traffic
- Lifting
- Slip, Trip and Fall
- Inexperienced Driver
- Struck by Vehicle
- Communications Barrier
- Backing Vehicle

**Required Personal Protective Equipment (PPE)**

- Safety Vest

1. Always make sure client can comprehend essential basic instructions or commands of the Examiner before beginning the road test.
2. When Examiner identifies obvious lack of experience in operation procedures, a learner’s permit should be issued in lieu of conducting road test.
3. Test should not be given in vehicle with glass that does not meet state safety standards.
4. When looking under vehicles, crouch with one knee down rather than bending at the waist.
5. Perform pre-operational checks on equipment, making sure the engine is off, parking brake is set and gearshift is in park position before beginning the inspection. Always conduct inspection in a safe, low traffic area. Never stand directly in front of or behind the client’s vehicle.
6. Use a 3-point mount and dismount when climbing on or off vehicles, never jump off.
7. Position headrest and vehicle seat to allow for adequate legroom. If the vehicle seat cannot be adjusted to a safe position away from the air bag, the Examiner should not continue the road test.
8. A seatbelt is required to be worn by the Examiner in all vehicles manufactured after 1964. If the seat belt is malfunctioning, broken or missing in vehicles manufactured after 1964, the Examiner should not continue the road test.
9. Examiners should maintain calm demeanor and issue simple, crisp instructions throughout the course of the road test.
10. To avoid road test accidents while clients are parking or backing in the parking lot, Examiners shall observe driver’s gear selection and look to the rear while the client is backing.
11. Observe client closely and constantly monitor traffic conditions. Be alert for inattentive drivers. During course of road test, if the client is determined to be inept/unsafe, pull to side of road and discontinue test.
12. If the Examiner observes a client action that could result in an auto accident, the Examiner should provide corrective commands to the client.
13. Use proper lifting techniques when moving objects such as motorcycle cones, boxes or other objects.

**Related SOP’s**

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SAFE OPERATING PROCEDURES

Training for Firearms  
SOP 11C-5

**Hazard Review**

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1. Unload weapon in a safe area, holster weapon and strap in.
2. Read all range rules and follow Range Officer’s Command.
3. Open cylinder or chamber and inspect to verify safe weapon.
4. Face downrange when weapon is drawn and hold weapon barrel in a downrange position.
5. Keep weapon pointed downrange with finger off trigger until ready to fire.
6. Load weapon in designated area before leaving range.
7. Inspect range for rocks, glass, snakes, insects, etc.
8. Maintain radio communication capability and adequate first aid equipment on site at all times.

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**Related SOP’s**

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SAFE OPERATING PROCEDURES

Field Emergency Response  
SOP 11D-1

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1. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
2. Make sure all emergency and warning lighting is working.
3. Plan for adequate supervision at the worksite.
4. Each response scene should be reviewed prior to starting work.
5. When you arrive at the scene, determine traffic control needs from the Work Zone Safety Handbook and your assessment of the situation.
6. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles/equipment operating in the work area; provide maximum protection for workers getting in and out of the vehicles and provides maximum protection for employees working at the scene.
7. Coordinate efforts with law enforcement, fire, and emergency management officials.
8. All employees shall be issued or be required to possess the following personnel protective equipment when responding to emergency situations: safety shoes or work boots, safety vest, gloves, hard hat, safety glasses, flashlight and rain gear. Items such as personnel flotation devices, chain saw chaps, boots and Tyvek suits shall be issued after an assessment and the hazards have been determined.
9. Employees on foot must use extreme caution to stay clear of operating equipment. Always establish eye contact with the operator before approaching equipment.
10. Be aware of escape routes in case of emergencies. It is a good practice to work facing oncoming traffic when on foot.
11. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
12. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold conditions.
13. When operating trucks and other equipment off the roadway, be aware of hidden objects in grass or unstable terrain.
14. Be observant of utility lines when cutting or removing trees and limbs. Look for and stay clear of downed power lines when clearing debris. Contact appropriate utility companies to coordinate work.
15. For nighttime response, adequate lighting should be provided.
16. Use flares/light sticks as appropriate.
17. When possible, at least two employees should be sent to respond to any emergency situation.
18. Approach flooding condition with caution. Do not attempt to drive through swift or rising floodwaters. Install appropriate advance warning/traffic control devices.

19. Approach accident scenes with caution. Do not send personnel or equipment into an area with explosive, flammable, or unknown substances until it is safe to do so. Drivers, passengers, placards, decals, shipping labels, Bills of Lading and the Emergency Response Guidebook might be sources of determining the unknown substances. Do not rely on rumors, rather BE SURE. Take measures to restore orderly traffic flow. Coordinate efforts with police, fire and emergency response officials.

20. When operating vehicles/equipment during winter storms or other inclement weather, adjust operating speed with the changing conditions. Follow Safe Operating Procedures for trucks, material spreaders and other snow/ice removal equipment.

21. For nuclear power plant disasters, refer to the appropriate nuclear plant Emergency Response Plan. There may be requirements to erect evacuation routes, shelter, signing, etc.

22. Be prepared to erect road closures and detour route signing to prevent traffic from entering the work site or an area obscured by fog/smoke or an area where the roadway is obstructed.

23. Clerk/dispatcher should be familiar with the operation of communication equipment (radio, telephone and computer terminal) and have the ability to receive and send communications accurately and timely.

24. Clerk/dispatcher should know the general locations of all response personnel on duty.

25. All personnel should cease all operations and seek shelter when wind speeds approach 40 MPH and not return until wind abates below 40 MPH.

26. Emergency generators should be in working order to provide power in case of a loss of commercial power. These generators should be periodically operated and maintained to ensure dependability. Personnel should be instructed in the proper use of emergency generators.

27. Temporary measures taken should be upgraded to appropriate standards as soon as practical following the emergency.

28. When working in or near the water, life preservers or other flotation devices should be worn.

29. Take precautions to prevent heat and cold stress when working in extremely hot or cold conditions.

30. Emergency response topics should be discussed at Monthly Safety Meetings.

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Hazard Review

Contaminated Soils  Landfills  Containment of Spills
Buried Power or Gas Lines

Required Personal Protective Equipment (PPE)

Safety Shoes  Safety Vest  Safety Glasses/Goggles
Gloves  Tyvek Suite

1. During drilling operations always be aware of the possibility of encountering potentially hazardous materials such as petroleum hydrocarbons, herbicides, pesticides, chemical manufacturing by-products or solid waste materials. In the event that any unknown or questionable materials are encountered, then the drilling operations are to be suspended immediately until further instructions are received. Do not handle any suspected contaminated materials.

2. During drilling operations always be aware of the possibility of striking an unlocated or improperly located gas or power line. In the event that a buried utility line is struck, drilling operations are to be suspended IMMEDIATELY. If the utility line is electric, then keep a safe distance from all metal surfaces connected with the drill rig. If the utility is gas, then the area should be evacuated and secured. Immediate notification of the utility company is MANDATORY.

3. In the event of a gas or oil spill, the proper authorities should be contacted immediately so that contaminant operations can be implemented. The type of contaminant operation and proper authority will depend on the geographic location of the spill.

Related SOP’s

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SAFE OPERATING PROCEDURES

Confined Space Entry

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<td>Confined space permit</td>
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<td>Rotting vegetation and dead animals</td>
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**Required Personal Protective Equipment (PPE)**

*(Based on job specific hazard review)*

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<td>Respirator</td>
<td>Mechanical ventilation</td>
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NCDOT operates in many different areas and situations where confined spaces may exist. Typical locations include the tanks, culverts, drop inlets, paint truck storage tanks, weigh station scale pits, vertical drill shafts and bridge beams. Any area which has a limited opening for entry and exit, or unfavorable natural ventilation, or that is not designed for continuous worker occupancy may be classified as a confined space.

1. Follow all manufacturers’ guidelines.
2. All employees shall be trained in the procedures and hazards of the space they are to enter.
3. All spaces shall be checked and evaluated by a qualified person before entry.
4. A qualified person shall evaluate for a hazardous atmosphere and complete a confined space entry permit before entry is allowed.
5. No entry will be allowed if any hazardous condition is detected, unless exposure can be eliminated or reduced utilizing the hierarchy of controls. All persons entering a confined space shall wear the personal protective equipment that is appropriate for the work to be performed.
6. If mechanical ventilation is provided, at least one person shall wear a multi-gas monitoring device. If an alarm sounds, all persons shall immediately evacuate the confined space.
7. Lockout/Tagout procedures shall be followed if the confined space contains mechanically active equipment.
8. The qualified person shall determine if the entry can be made without a qualified attendant or if a standby person is necessary.
9. If an attendant is required, he shall:
   a) Be trained in rescue from outside techniques
   b) Not enter confined space under any circumstances
   c) Be within sight or call of the entrant and have the means to summon assistance.

Prior to entry into a permit-required confined space, trained/certified rescue organization should be on site if NCDOT personnel are not trained in rescue.

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SAFE OPERATING PROCEDURES

Construction Safety Emphasis Areas  SOP 11E-2

Hazard Review

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Required Personal Protective Equipment (PPE)

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<td>Body Harness/Lanyard</td>
<td>Gloves</td>
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The purpose of this SOP is to identify imminent danger situations or hazardous operations occurring on construction projects. Contractors performing under construction contracts with NCCOT are required to comply with all provisions of the North Carolina Occupational Safety and Health Standards for the Construction Industry. The following safety emphasis areas must be especially noted and complied with by the on-site contractor(s).

Contractor Awareness

- Contractor must be made aware of these safety emphasis areas by the on-site engineer responsible for the overall project.

Corrective Action

- Refer to the Construction Manual, Appendix _____ for guidelines for corrective action when the contractor is non-compliant in these safety emphasis areas.

Other Pre-Cautionary Safety Measures

- Ensure signing and traffic control is in accordance with project traffic control plans.
- Wear appropriate personal protective equipment consistent with the hazard, i.e., visibility, noise, dust.
- Avoid walking and working under suspended loads. Hard hats must be worn when working around backhoes, cranes, excavators, etc.

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<td>Fall Protection</td>
<td>Safety railing meeting the requirements of 1926.451 is required on all substructure and superstructure falsework 6 ft or more above the ground or lower level.</td>
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<td></td>
<td>On operations 6’ or more above the ground such as setting of structural steel and setting of grades on structural members where the use of other fall protective measures is impractical, fall protection shall consist of the use of harnesses and lanyards. (Effective 1/1/98, safety belts can no longer be used as fall protection but can be used as positioning devices.)</td>
</tr>
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## Safety Emphasis Areas

### Required Actions

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<th>Safety Emphasis Areas</th>
<th>Required Actions</th>
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<tr>
<td>Crane Safety</td>
<td>• Lifting hooks shall be equipped with operable safety latches.</td>
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<td>• All accessible areas within the swing area of the rotating superstructure of the crane shall be blocked out.</td>
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<td>• When used to hoist personnel, cranes shall be equipped with controlled load lowering and a two block damage prevention device.</td>
</tr>
<tr>
<td>Equipment</td>
<td>• All equipment with an obstructed view to the rear shall be equipped with an audible backup alarm or shall utilize a “spotter” when operated in the reverse mode.</td>
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<tr>
<td>Excavation Protective Systems</td>
<td>• Protective systems meeting the requirements of 1926652 shall be used on all excavations such as pipe trench (storm drain, underdrain, and utility), undercut, drainage structure, manhole, foundation, and retaining wall.</td>
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### Related SOP’s

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Construction Safety Emphasis Areas – SOP 11E-2
SAFE OPERATING PROCEDURES

Excavating, Trenching and Shoring  
**SOP 11E-3**

**Hazard Review**

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**Required Personal Protective Equipment (PPE)**

*(Based on job specific hazard review)*

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<th>Gloves</th>
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</thead>
<tbody>
<tr>
<td>Hard Hat</td>
<td>Safety Vest</td>
<td>Safety Glasses/Goggles</td>
</tr>
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</table>

1. No excavation work shall be started until efforts have been made to determine if underground utilities are located in the area. Use NC811 (call 811) free underground utilities locator services to mark underground lines (3) working days before excavation begins.

2. Any excavation 4 feet or more in depth shall:
   a. Be provided with adequate means of access and egress (steps, ladder, or ramp) within 25 feet if employees are expected to enter trench.
   b. Be tested for hazardous gases or oxygen deficiency if such conditions are likely to exist.

3. Any excavation 5 feet or more in depth must meet the same conditions as in item 2 above and have adequate means of protection from cave-in (sloping, shoring, shielding). If a protective system is to be utilized, information on the installation, use, placement and removal must be kept on site. If sloping is utilized, it must be at 34 degrees (or 1 ½:1). No soil classification is required (all soil on NCDOT projects will be classified as Class “C”).

4. A professional engineer is required to design protective systems at depths greater than 20 feet.

5. Only NCDOT personnel who have received excavation, trenching and shoring training, and who have been given the authority to take prompt actions to eliminate unsafe conditions associated with a trenching operation may be qualified as “competent persons”.
   a. The “competent person” shall be capable of identifying existing and predictable hazards such as water intrusion, working conditions that are hazardous, unsanitary or dangerous to workers, and protective systems required.
   b. Trenching operations shall be inspected by a designated “competent person” each day prior to and during the work shift.
   c. The designated “competent person” must be on site at all times and shall stop work if hazardous conditions are identified.
   d. The designated “competent person” shall not be the equipment operator or have other work responsibilities while assigned to a specific excavation/trenching operation.

6. Employees shall not work under loads being handled by excavating or lifting equipment.

7. If employees enter the excavation, both the removed soil and other work material shall be stored at least two feet from the edge.

**Related SOP’s**

- General SOP’s...........................................Chapter 10
- SOP 11B-44.............. Inmate Labor
SAFE OPERATING PROCEDURES

Explosives SOP 11E-4

Hazard Review

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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1. Only those NCDOT employees who are trained and certified shall direct, use, transport, or conduct blasting operations. All Explosive Specialists must receive initial NCDOT Explosives Training with retraining every three (3) years. This training is offered once annually by Safety and Risk Management.

2. Any driver transporting explosive materials shall have received HazMat Endorsement training where a HazMat Endorsement training card is issued for 3-year period. Retraining is required after 3-year period ends. (Blasting school trains for explosive material transport). Smoking, carrying matches or any other flame producing devices, firearms, or loaded cartridges is prohibited.

3. Several Explosives Specialists may support blasting operations however; Only one Explosive Specialist will be designated Lead Blaster (Blaster in Charge) for each operation and is the single point supervisor of the entire blasting operation. The Lead Blaster will not be overridden by other supervisors in the performance of duties (i.e. Make the shot-when not safe, etc…). When the explosives are set, it is too late to change the shot. All conflicts must be resolved. Assistance from Director, Safety and Risk Management (SRM) is available by calling (866)361-1818 (24/7/365) or reporting issue to anyrisk.nc.gov.

4. The Lead Blaster may designate an Assistant Lead Blaster to support their role however, communication is key. The Lead Blaster is the final decision maker.

5. Shot design including drilling, patterns, etc…. are the responsibility of the Lead Blaster.

6. Drilling of shot holes, patterns, etc…. will be under the direct supervision of the Explosive Specialist.

7. All shot plans must have a sketch created showing number of holes, pattern, and the amount of explosives per hole including pounds per delay, if used. The form “NCDOT Blaster’s Shot Plan” is required.

8. Blasting Machines must remain under the control of the Explosive Specialist and never left unsecured.

9. Unused explosive shall not be left unsecured (out of sight of the Explosive Specialist) at any time.
SAFE OPERATING PROCEDURES

Hazardous Waste Handling and Storage SOP 11E-5

Hazard Review

- Slips, Trips, and Falls
- Suspended Loads
- Unknown Hazardous Materials
- Chemical Releases
- Confined Spaces
- Fire

Required Personal Protective Equipment (PPE)

- Safety Shoes
- Gloves
- Safety Glasses/Goggles
- Hard Hat
- Safety Vest
- Respirator

1. Be aware of containers with unknown and/or unlabeled substances. Accidentally mixing waste materials could cause a chemical reaction resulting in fire, explosion, or atmospheric release of toxic vapors. Be alert for heat build-up, vapors, rumbling noise, etc. In such cases, stop work, vacate the area and notify supervisor.

2. Be familiar with the facility plans and other related rules/guides for handling hazardous waste materials. Notify the supervisor if a hazardous substance is spilled. Use proper procedure for clean up, including the use of personal protective equipment.

3. Material handling equipment (forklifts, trucks, etc.) shall be operated in a safe manner, as established in applicable training programs and manufacturers guidelines. The moving of heavy containers could result in punctures. Be alert for leaks, dampness, unusual debris and strange odors caused by airborne contaminants.

4. Posted MSDS should be read and complied with.

5. Operate oil/water separator only with approval of supervisor.

6. Frequently check pressurized hoses and piping for leaks.

7. Proper lifting techniques shall be used. Get help or use lifting equipment if necessary.

8. Confined spaces must be well ventilated prior to entry and checked by a certified competent person. Never enter a confined space without a standby observer.

9. Be aware of fire extinguishers, alarm and hose locations. Check routinely to make sure they are working properly. Follow good housekeeping practices to reduce the risk of fires.

10. Be aware of loose or slippery materials, tripping hazards and other obstructions. Take appropriate measures to eliminate them.

11. Avoid walking or working under suspended loads. Wear hard hat when working around cranes, forklifts, loaders, etc.

12. Safety vest should be worn when exposed to vehicular traffic.

13. Hazardous materials should only be handled by properly trained personnel.

14. Be familiar with local emergency numbers.

15. The “Poison Control Center, Durham” number is 1-800-672-1697.

16. The “National Response Center, Oil and Toxic Chemical Spills” number is 1-800-424-8802.
SAFE OPERATING PROCEDURES

High Pressure Hoses

Hazard Review

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Required Personal Protective Equipment (PPE)

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1. High Pressure hoses should not be kinked. Check hose fittings for proper connections.
2. Operator should never leave machine while pumping is in process.
3. Only nozzle operator will direct the pump operator when to start pump.
4. Make sure all hoses and nozzles are in good shape.
5. DO NOT USE HANDS OR FINGERS to find leaks. Fluid under high pressure can be injected into skin causing extreme injury or serious infection.
6. Do not stand over hoses.
7. Watch for slipping/tripping hazards in the work area.
8. Use proper lifting procedures for moving hose and placing bagged material.
9. Clean machine properly and thoroughly at end of shift.
10. Make sure all dead man shut-off valves work properly.
11. Do not allow heavy equipment to run over hoses.
12. Do not point outlet end in direction of yourself or other personnel in the work area.
13. Make sure safety chains are properly attached at connections.
14. Safety Glasses and gloves are required when working with all types of high pressure hoses if the system is pressurized.
SAFE OPERATING PROCEDURES

Jump Starting

Hazard Review

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Required Personal Protective Equipment (PPE)

| Safety Shoes | Safety Glasses/Goggles | Gloves |

1. Improper procedures or techniques may result in personal injury and/or damage to the electrical system or computer components.
2. Employee MUST COMPLETE BATTERY TRAINING before jump starting equipment.
3. Is the vehicle in a safe location to be jump started? All vehicles must be in park/neutral with parking brakes applied.
4. If the battery is distorted/deformed, cracked, leaking, or missing a vent cap, DO NOT jump start, call for assistance.
5. Safety glasses/goggles and gloves are required.
6. When working at night, have adequate lighting available.
7. Avoid leaning over the battery whenever possible.
8. Do not expose the battery to open flames or sparks (NO SMOKING).
9. Be sure any batteries that have filler caps are properly filled with fluid.
10. Do not allow battery acid to contact eyes or skin.
11. Both discharged and charged batteries must be of the same voltage.
12. Do not stand between vehicles.
13. Use proper procedure in accordance with the operator’s manual. Use remote jump-start terminals if equipped. If no special instructions apply, proceed as follows for negative grounded batteries:
   - Make the jumper connections:
     - Connect one end of the red jumper cable to the positive (+) terminal of the booster battery and the opposite end to the positive (+) terminal of the discharged battery
     - Connect one end of the black jumper cable to the negative (-) terminal of the booster battery and the opposite end to an engine bolthead or good metal contact on the vehicle to be started, not to the negative battery terminal of the discharged battery
     - Check the cables to make sure they will not be in the way of moving parts when the vehicle is started
     - Start the engine of the vehicle with the good battery and run it at a moderate speed
     - Start the engine of the vehicle with the discharged battery
     - Remove all cables in reverse sequence. Begin by removing the cable from the engine of the vehicle that had the discharged battery.

14. Keep hands and equipment from all moving parts, belts, machinery, etc.
15. Never use external heat to aid in starting equipment when volatile materials are present.
SAFE OPERATING PROCEDURES

Lockout/Tagout SOP 11E-8

LockOut/TagOut procedures are designed to isolate or shut off machines and equipment before employees perform any servicing or maintenance work. Each person who may work on equipment shall be trained on this standard before conducting any work. General guidelines for implementing this standard are:

1. Only persons who are trained and authorized may work on equipment. This training must be documented in the facility lockout manual.
2. All employees that work in the facility and are not “authorized” must be trained as an affected employee. This must also be documented in the facility lockout manual.
3. All machinery and equipment which may be started or which may release energy during servicing must be positively locked out.
4. All employees must honor lockout/tagout devices. No employee may remove a lock unless they have installed it.
5. Each person performing service or maintenance work must have his own individual lockout device. Locks must be standardized by color, shape, size or type.
6. Employees implementing a lockout procedure shall notify employees in the immediate vicinity of his actions.
7. Machinery or equipment shall be shut down through its normal stopping procedure before the lockout device is applied.
8. The lockout device shall be installed at a place where the machinery or equipment can be isolated from its energy source.
9. The equipment shall then be checked to ensure that it is inoperable before any work is performed.
10. The machinery or equipment shall not be restored to operation until all tools are removed and a check is made to ensure no personnel are in a hazardous area.
SAFE OPERATING PROCEDURES

Rigging

SOP 11E-9

Hazard Review

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Required Personal Protective Equipment (PPE)

| Safety Shoes | Hard Hat | Gloves |

1. Before use, inspect cable, chain or wire rope for wear and replace if necessary.
2. Observe OSHA guidelines for use of cable clamps, safety latches, chains and slings.
3. Know rated capacity of cable, chain or wire rope being used.
4. Avoid overloading and sudden jerks.
5. Wear appropriate personal protection equipment consistent with the hazard, including hard hats, safety glasses and work gloves.
6. Loads to be lifted shall be checked for balance and the rigging inspected to ensure a safe and balanced condition.
7. Employees shall not stand or work under suspended loads.
8. Awkward loads should have taglines attached to control the load.
9. Review signals and operator communications. Only one person shall direct the operator.
10. Review the area for utility lines, tree limbs and other overhead safety hazards.
11. Personnel working tag lines should review area for slipping, tripping and falling hazards. If not possible to eliminate them, then take precautions to avoid them.
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SAFE OPERATING PROCEDURES

Versaflow Respirator 3M TR-300 Series SOP # 11E-10

Hazard Review

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2. This SOP is for the use of the 3M TR-300 series PAPR (Powered Air Purifying Respirators) and compatible 3M hood and accessories.
3. The TR-300 series respirator will only be worn by NCDOT employees who have received prior medical clearance for respirator use in accordance with 29 CFR 1910.134(e).
4. The TR-300 series respirator will be used for PARTICULATE HAZARDS ONLY, including lead and silica. The TR-300 series respirator will not be used for protection from volatile organic compounds (VOCs), acid gas, or ammonia inhalation hazards.
5. The TR-300 series respirator will not be used in any emergency or immediately dangerous to life and health (IDLH) atmospheres.
6. Do not modify or service the TR-300 series respirator. Employee names or dates of filter changes may be written on the filter/cartridge or motor/blower. Do not write on the filter material or the headgear.
7. The TR-300 series respirator will be inspected prior to each use. For inspection the belt, battery pack, filter/cartridge, air tube, and headgear should all be disconnected from the motor/blower. All inspections should be performed when the respirator is OFF unless specified.
   a. The exterior of the motor/blower should be inspected for cracks or damage.
   b. The motor/blower surface beneath the filter/cartridge should remain clean. Contaminants in this area may be indicative of improper filter installation or a faulty filter gasket.
   c. All LED buttons/indicators on the motor/blower should be visible and illuminated at the start-up of the respirator.
   d. The outlet of the motor/blower (where the air tube attaches) should be inspected for any contaminants or damage which may affect proper air tube attachment.
   e. The belt attachments on the back of the motor/blower should be undamaged.
   f. The airflow must be checked using the provided 3M airflow indicator to ensure the filter is not overloaded. Once the indicator is placed in the motor/blower outlet, the assembled respirator is to be turned ON. The ball must be above the indicator line for the respirator to pass inspection when viewed at eye level (pictured). If the ball is stuck or jammed it can be freed with water and then allowed to dry. If the ball is not pushed above the acceptable indicator line the filter/cartridge must be exchanged for a new one and the motor/blower airflow must be retested.
   g. Check the low-flow alarm by turning on the assembled respirator by holding your hand over the motor/blower outlet for 30 seconds. If the low-flow alarm does not go off, or is not visible and audible, do not use the respirator. The alarm should subside once your hand is removed.
h. Inspect the filter and filter cover for any tears, damage, or signs of water damage or overloading. If any of these are observed discard the filter and replace with a new one.

i. Inspect the prefILTER or spark arrestor for any damage if either is used. Neither the prefILTER nor the spark arrestor are required for use, but they may provide valuable protection or longevity of the filter. Do not use the prefILTER and spark arrestor simultaneously on the same motor/blower.

j. Inspect the inner filter seal gasket and filter release button for any damage or wear.

k. Inspect the battery pack, hinge, release button, and all contacts for any damage or corrosion.

l. Push the “TEST” button on the battery pack to indicate the charge level prior to use. Five LEDs indicate the battery is fully charged. A fully charged battery should last around 5 hours. Be sure not to attempt to use the TR-300 series respirator longer than the battery life allows.

m. The battery should be recharged after each use, but should not remain on the charger docking station due to risk of overheating or damage.

n. The battery charger should be routinely inspected for any frayed wires, debris, or damage to the gold contact pins.

o. The headgear, hood, and faceshield will be inspected for any tears, holes, stains, or other damage prior to use. If any significant wear is observed do not use the respirator.

8. The TR-300 series respirator will be cleaned after each use. All disassembled parts of the respirator are to be wiped down with water and mild detergent or dish soap. Other approved cleaning solutions include <3% hydrogen peroxide, <0.5% bleach, and 3M Neutral Cleaner.

a. Do not use any organic solvents or strong acids or bases, especially on the faceshield and hood, as these may cause damage or deterioration.

b. Do not submerge the motor/blower portion of the respirator, and ensure that no liquids enter the outlet port.

c. Remove the filter/cartridge and battery pack prior to cleaning the motor/blower. Ensure that all battery connector pins are dry prior to storage or use.

d. Do not clean the optional prefilters, this may cause damage or deterioration.

e. Wipe down the filter/cartridge but be careful not to wet the filter material.

f. Do not use compressed air to clean the TR-300 series respirator.

g. The faceshield and hood must be properly cleaned to maintain visibility and comfort for the next user. Ensure that the hood is free from any odor prior to storage.

h. The air tube may be submerged for cleaning, if desired. It can be dried by connecting it to the motor/blower and forcing air through it. Do not use the respirator if the air tube is not completely dry.

i. Ensure that any debris or dust is wiped clean from all parts of the respirator prior to storage. Certain dusts (e.g. lead) must be handled appropriately as hazardous waste once collected on a cloth or wipe. Nitrile or vinyl gloves should be worn if cleaning the respirator may result in a hazardous exposure.

j. The TR-300 series respirator may be worn through a decontamination shower while in operation.

9. The TR-300 series respirator will be stored in a cool, dry place (<120°F).

a. The respirator will be stored in its original packaging or a similar, sealed plastic bag.

b. The respirator will not be stored long-term in a vehicle or piece of heavy machinery.

c. The respirator will not be stored in any location where it may be damaged by sunlight.

d. The filter cartridges should be removed during storage to extend the service life of the filter gaskets.

e. For storage of longer than 30 days, the battery packs should be removed from the motor/blower.

f. The battery charger will be stored in a cool, dry place free from debris.
SAFE OPERATING PROCEDURES

Asphalt Distributor/Kettle

Hazard Review
Traffic Mounting/Dismounting Backing
Flammable Liquids

Required Personal Protective Equipment (PPE)
Safety Shoes Gloves Safety Vest
Safety Glasses/Goggles

1. All drivers shall be properly licensed.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
4. Always know location of fire extinguishers and ensure that they are properly charged. Remove fire extinguisher and have nearby prior to firing distributor.
5. Use gloves or insulated material when handling heated spray bar sections or hoses.
6. To avoid having hot material overflow from the tank, allow sufficient space in the tank for expansion of the material when heated. Do not overfill. Keep tank and burner areas clean.
7. To prevent an explosion or possible fire, do not operate burners unattended, while vehicle is in motion or in a confined area.
8. To prevent a possible explosion, do not heat material beyond manufacturer’s recommended temperature. Do not light burner(s) unless the flue is covered by a minimum of 6 inches of asphalt.
9. Plan ahead to minimize or eliminate backing. Always check to the rear before backing and use an observer if available. Make sure back-up alarms are working properly.
10. No personnel shall be allowed to ride on the rear, i.e., when the vehicle is equipped with interior cab-mounted controls. If a greater hazard is created by using cab-mounted controls, such as when maneuvering on narrow, twisting roadways, personnel may be allowed on the rear of the vehicle, if adequate fall protection is provided.
11. Make sure appropriate decals and placards are displayed on distributor.
12. Operators and passengers shall wear seat belts and shoulder harnesses as provided.
13. Operators should be aware of employees and others on foot in work zone.
14. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
15. If vehicle is equipped with A.C. engine heater and/or tank heater, first switch current off and then unplug heater before operating either piece of equipment.
16. Operator shall stop at all unsignalized railroad grade crossings.
17. Eye protection (safety glasses) and gloves are required when loading or unloading material.

Related SOP’s
General SOPs................................................. Chapter 10
SAFE OPERATING PROCEDURES

Bark Spreader SOP 12A-2

Hazard Review

-Backing
- Mounting/Dismounting
- Unsecured Loads
- Overhead Objects/Lines
- Flying Objects
- Unlevel Terrain

Required Personal Protective Equipment (PPE)

- Safety Shoes
- Hearing Protection
- Safety Vest
- Gloves
- Safety Glasses

1. All drivers shall be properly licensed.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and/or shoulder harnesses as provided.
5. Keep windshield, windshield wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
8. No personnel shall be allowed to ride anywhere except in the cab when the vehicle is in motion unless the vehicle is designed to accommodate an individual outside the cab.
9. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots.
10. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
11. Operators should be aware of employees and others on foot in work zones.
12. Make sure cargo is properly loaded, secured and covered. Check for loose material on bed rails and chassis.
13. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
14. Be aware of overhead utility lines when spreading material.
15. When operating vehicle off the roadway, be aware of hidden objects in the grass and unstable terrain.
16. Make sure area to be mulched is clear of people, other equipment and vehicles.
17. Operator is to be aware that there will be flying debris. Watch for passing traffic.
19. Stay off hills and slopes too steep for safe operation.
20. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.

Related SOP’s

General SOPs ................................................. Chapter 10
SAFE OPERATING PROCEDURES

Broom

Hazard Review
Traffic         Dust                   Mounting/Dismounting
Backing        Pinch Points

Required Personal Protective Equipment (PPE)
Safety Shoes   Safety Vest   Safety Glasses
Dust Mask

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Check frame for cracks and loose bolts.
3. If visual obstruction due to sweeping causes potential traffic hazard, use alternate method for traffic control.
4. Check for proper hook-up of sweeper to towing vehicle and use safety chain. Check chain before leaving yard.
5. Operators should be aware of employees and others in work zones.
6. Keep hands and feet clear when adjusting sweeper angle.
7. While driving, always scan the entire area for possible hazardous situations.
8. When deadheading, make sure broom is raised and locked in place.
9. Use water to control dust.
10. Protect towing vehicle from rock damage.
11. Operators shall wear seat belt and/or shoulder harnesses as provided.
12. Dust mask and eye protection (safety glasses) should be worn if operating an open cab broom tractor.
13. Safety vest should be worn when outside of the cab of the tractor.
14. When in operation, only the operator shall be permitted on the machine.
15. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
16. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
17. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.

Related SOP’s
General SOPs ..................................................Chapter 10   Tractor, Wheel ..................................................12A-25
SAFE OPERATING PROCEDURES

Crane/Dragline

Hazard Review

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Required Personal Protective Equipment (PPE)

| Safety Vest | Hard Hat | Safety Glasses |
| Safety Shoes | Hearing Protection | Gloves |

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Do not operate boom within 10 feet of power lines.
3. Check boom daily for cracks, deformities, oil leaks or loose pins, nuts and bolts.
4. Check boom hook for cracking or spreading and loose pins.
5. Make a daily check of wire rope, cable or chains for deformities.
7. Workers shall not be allowed under boom during operation.
8. Never exceed maximum lifting capacity of boom.
9. Only one person shall operate the crane and only one person shall signal and assist the operator.
10. Do not rock the boom and always use a smooth pull.
11. Crane deck shall be kept clean and free of obstructions.
12. When swinging boom, change direction slowly.
13. Do not pull objects directly toward operator position.
14. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
15. Do not use chain and grab hooks when working on mats.
16. Position drop line as close as possible to the balance point of the load.
17. Crane shall be made level before beginning work.
18. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
19. Operators should be aware of employees and others on foot in work zones.
20. Operators should make a visual inspection of work area prior to beginning work.

Related SOP’s

General SOPs ................................................. Chapter 10  Rigging......................................................... 11E-9
Excavating, Trenching and Shoring............. 11E-3
SAFE OPERATING PROCEDURES

Excavator, Hydraulic

Hazard Review

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| Required Personal Protective Equipment (PPE)              |
| (Based on job specific hazard review)                    |

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<tr>
<th>Safety Vest</th>
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1. Supervisors shall verify that drivers are capable and are qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Call 811 before project begins to have underground lines located and marked prior to excavating. Allow 2 -3 days for 811 locator service to mark area.
3. Drivers shall perform a pre-operational check of their equipment and maintain with equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Before digging, review Excavating, Trenching and Shoring guidelines as contained in Chapter 11E of this manual.
5. Operators shall wear seat belts and or shoulder harnesses as provided.
6. Keep windshield, windshield wipers, side windows and mirrors clean.
7. When mounting or dismounting equipment use steps and hand holds provided using the 3 points of contact while facing equipment. Do not jump from vehicle.
8. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
9. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
10. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots.
11. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged. Make sure the sight glass is clear and visible with no rust on the extinguisher.
12. Operator should do visual inspection of the area and verify terrain conditions prior to beginning work.
13. Have a ground spotter watching during unloading/loading and excavation operations.
14. Operators should be aware of employees and others on foot in work zones and be sure area is clear of personnel before lowering stabilizers or moving the boom.
15. Stop excavator if you notice personnel within 360 degree radius or reach of excavator if they are not wearing hard hat.
16. If operating excavator with front windshield in up position, operator must wear safety glasses for eye protection.
17. Do not leave attachments in the raised position when equipment is not in use. Always lower them to the ground.
18. When in operation, only the operator should be permitted on the machine.
19. Be sure outriggers are properly set before operating excavator.
20. Never allow anyone to work under a raised bucket or ride the bucket in or out of a trench or ditch.
21. Do not operate boom within 20 feet of energized power lines.
22. Utilize trailer whenever possible to transport excavator. Check all trailer decks for broken boards or grating and loose debris which could fall off during transport.
23. Utilize a spotter to load or unload excavators from trailers and keep a visual check on clearance from overhead power line.

Related SOP’s

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SAFE OPERATING PROCEDURES

Fork Lift

Hazard Review

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1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use equipment that is unsafe.
3. Seatbelts must be worn while operating forklifts. Horseplay is strictly forbidden.
4. Gas powered forklifts shall only be operated in well-ventilated areas.
5. Rated capacity must be stated on forklift. Do not overload.
6. Riders shall not be permitted on forklifts.
7. Loaded forklifts shall not be moved until load is safe and secure.
8. All unattended forklifts shall have mast at vertical position, forks in the down position, engine off and parking brake set.
9. Forklifts shall not be driven up to anyone standing in front of a bench or fixed object where such person could be caught between the forklift and object.
10. Operators shall look in the direction of travel and not move forklift until certain that all persons are clear.
11. The forks shall always be carried as low as possible. Make sure counterweights are in place.
12. Forklifts shall not be driven into and out of trailers at loading docks until such trailers are securely blocked and brakes set.
13. Employees shall not place any part of their body outside the running lines of the forklift or between mast uprights or other parts of the unit where shear or crushing hazards exist.
14. Employees shall slow down and sound horn at all locations where visibility is obscured or obstructed. If the load being carried obstructs forward view, the operator shall be required to travel with the load trailing. Avoid sharp turns and sudden starts and stops.
15. Employees shall not be allowed to stand, pass, or work under the elevated portion of any forklift.
16. Extreme care shall be taken when tilting loads. Tilting forward with forks elevated shall be prohibited except when picking up a load. Tilting elevated loads forward shall be prohibited, except where the load is to be deposited on a storage rack or equivalent.
17. Special precautions shall be taken in the securing and handling of loads by forklifts equipped with special attachments and during the operation of these trucks after loads have been removed.
18. Employees shall only be lifted in forklifts designed specifically for this use.
19. When the forklift is in motion, the masts should be tilted. When forks are empty, mast should be tilted to the rear to prevent tips of forks from contacting ground. When the forklift is parked, the tips should be flat on the ground.
20. Check overhead clearance of doorways and entrances.
21. If equipment has air brakes, be sure pressure is up before moving.
22. Avoid abrupt hydraulic system movement, which could rupture hydraulic hoses.

**Related SOP’s**

General SOPs............................................. Chapter 10
Grader

**SAFE OPERATING PROCEDURES**

**Hazard Review**

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**Required Personal Protective Equipment (PPE)**

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</table>

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
4. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
5. When operating grader, be aware of protruding or overhanging objects or limbs.
6. When traveling, make sure blade is properly positioned under grader. Slow down when crossing railroad tracks.
7. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
8. Be on the lookout for hazards in or adjacent to the travel way, such as bridge joints, curbs, manhole covers and other utilities.
9. Operators shall wear lap belt while seated or standup harness while standing, if possible.
10. Tire chains should be utilized as dictated by weather conditions.
11. Operators should be aware of employees and others on foot within work zone.
12. When in operation, only the operator shall be permitted on the machine.
13. Operators shall never allow machine to coast downhill with transmission in neutral.
14. Use extreme caution when operating grader on steep slopes or along the edge of fills to avoid overturning.
15. Grader should be parked with blade in down position. Shut off engine when equipment is not in use.
16. If operating grader with door open, make sure it is properly fastened. Do not attempt to open or close door when moving.
17. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spot.
18. When deadheading use low volume roadways if available. Pull over to allow vehicles to pass.
19. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.

**Related SOP’s**

General SOPs ........................................... Chapter 10  Rotary Slope Mower ................................. 12A-18
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SAFE OPERATING PROCEDURES

Hydro Seeder

Hazard Review

Mounting/Dismounting     Overhead Dangers     Backing

Required Personal Protective Equipment (PPE)

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<td>Safety Vest</td>
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</table>

1. All drivers shall be properly licensed.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and or shoulder harnesses as provided.
5. Keep windshield, windshield wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and hand holds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is engaged in normal daily work operations, i.e. herbicide spraying, spreading straw, blowing mulch, etc.
8. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots.
10. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
11. Operators should be aware of employees and others on foot in work zones.
12. Make sure cargo is properly loaded, secured and covered. Check for loose material on bed rails, chassis and operator platform.
13. For inclement weather, truck speed should be adjusted for load and weather.
14. Be aware of utility lines and other overhead dangers when spreading material.
15. When operating vehicle off of the roadway, be aware of hidden objects in the grass and unstable terrain.
16. Insure safety rails are in place.
17. Apply tank mixture to target areas only. Avoid operating during strong winds.
18. Stay off hills and slopes too steep for safe operations.
19. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
20. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.
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Hydro Seeder – SOP 12A-8
SAFE OPERATING PROCEDURES

Lawn Mower  

Hazard Review

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Required Personal Protective Equipment (PPE)

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1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.

2. Check condition of drive belts before starting.

3. Check area and clear rocks and debris before mowing.

4. Clear all persons from path of potential flying objects.

5. Avoid entangling blade in wires, ropes, or cables.

6. Make sure seat is properly secured to machine.

7. Make sure mower is in neutral or park before starting.

8. Do not carry passengers on mower.

9. Use mower only for its designed purpose.

10. Use care while operating over uneven terrain.

11. Do not dismount machine unless stopped.

12. Disengage mower when not cutting.

13. Keep feet and hands clear of mower blades.

14. Do not refuel a running or hot engine.

15. Keep all guards in place at all times.


17. Never attempt to start or operate the machine except from the operator’s station.

18. Check frame and mower deck for cracks and loose bolts.

Related SOP’s

General SOPs ..................................Chapter 10
SAFE OPERATING PROCEDURES

Loader, Force Feed  
SOP 12A-10

Hazard Review

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Required Personal Protective Equipment (PPE)
*(Based on job specific hazard review)*

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<tr>
<td>Safety Glasses</td>
<td>Insect Repellent</td>
<td>Sun Screen</td>
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</table>

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Be sure that all guards or shields are covering the rotating and moving parts of the machine.
3. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
4. Travel slowly when moving over rough terrain w/ conveyor in lowered position.
5. Never drive too close to edge of a ditch, fill slope or excavation.
6. Watch for overhead obstructions.
7. Stay clear of all moving parts, cables, shafts, belts, flywheels, etc.
8. While driving, always scan the entire area for possible hazardous situations.
9. Never attempt to start or operate the machine except from the operator’s station.
10. Do not oil, grease or adjust the unit while it is in motion.
11. Operator and passengers (equipment with passenger seating) shall wear seat belts and/or shoulder harnesses as provided.
12. Use shovel or another tool to unclog belt. Never try to unclog the belt by hand. (System must be shut down when performing this function.)
13. Be familiar with all safety shut down devices.
14. Operator should be aware of employees and others on foot in work zones.
15. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
16. When in operation, only the operator shall be permitted on the machine.
17. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
18. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
19. Keep windshield, windshield wipers, side windows and mirrors clean.

Related SOP’s

*General SOP’s..........................Chapter 10  Broom...............................12A-3*
*Truck, Dump .............................12A-30*
# SAFE OPERATING PROCEDURES

## Loader, Front End

### Hazard Review

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### Required Personal Protective Equipment (PPE)

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1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
3. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
4. Operators shall wear seat belts and/or shoulder harnesses as provided.
5. Keep windshield, windshield wipers, side windows and mirrors clean.
6. Make visual inspection of work area before starting operations.
7. When in operation, only the operator shall be permitted on the machine.
8. Carry bucket low to ground (loaded or unloaded).
9. Stop loader with brakes, not transmission.
10. Do not operate the loader or controls from any position other than the operator’s seat.
11. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
12. Operators should be aware of employees and others on foot in work zones.
13. Do not swing bucket over truck cab or ground crew.
14. Build berm prior to dumping over banks.
15. When operating machine on side hill, never allow anyone to remain down slope while machine is in motion.
16. Never allow machine to coast downhill with transmission in neutral.
17. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots. Properly secure equipment.
18. Engage safety steering lock while holding and before working on loader.
19. Always lock equipment properly when parking overnight or for an extended period.
20. When deadheading, use low volume roadways if possible. Pull over to allow vehicles to pass.
21. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.

### Related SOP’s

- General SOPs ......................................Chapter 10
- Truck, Dump ........................................12A-30
- Trailers and Towed Equipment ..................12B-30
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Centerline Paint Machine  
SOP 12A-12

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1. Follow all manufacturers’ guidelines.
2. All drivers shall be properly licensed.
3. Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
4. Operators shall review Safe Operating Procedures for applicable equipment and perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
5. Operators and passengers shall wear seatbelts and shoulder harnesses (if equipped) whenever the painting vehicle travels to the next painting site at speeds exceeding 20 mph. Alternately, painting operators may move to the cab and be secured by those safety belts and harnesses if the distance to the next job exceeds 1 mile.
6. Operators must wear properly secured safety belts at their working stations if:
   a) they are not operating the controls while standing or
   b) they can easily reach the controls while seated.
7. Keep windshield, windshield wipers, side window, and mirrors clean.
8. When mounting or dismounting equipment, use steps and hand holds provided. Do not jump from vehicle.
9. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
10. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
11. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots.
12. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
13. Operators should be aware of employees and others on foot in work zones.
14. When doing emergency maintenance, be aware of hazards as a result of other vehicle traffic and to other personnel.
15. Be aware of overhead obstructions.
16. When operating vehicle off of the roadway, be aware of hidden objects in the grass and unstable terrain.
17. Check paint valves and hoses for wear and leaks.
18. Be sure there is no pressure on paint system when setting up, cleaning, pulling filters, or servicing guns.
19. Choose place for setting up away from traffic, if possible.
20. When securing at end of day, bleed entire system of pressure. Never leave pressure in system. Check air valves and hoses for wear and leaks.
21. Do not use pressurized air to clean yourself.
22. Have a communication system between driver and operator. Use appropriate DOT hazard class placard for material being used.
23. Release pressure on bead tank, paint and solvent tanks before removing lid.
24. The use of shadow vehicle with impact attenuator is recommended for high volume roadways.
25. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.
26. Operator shall stop at all un-signalized railroad grade crossings.

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Pavement Grinder and Milling Machines  SOP 12A-13

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1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Implement Traffic Control Plan as specified in both NCDOT Standard Specifications and Drawings for Work Zone Traffic Control and MUTCD.
4. Park in areas that: provide safe entrance and exit of the work area; do not create potential conflicts with other vehicles and equipment operating in the work area; and provide maximum protection for workers getting in and out of the vehicles.
5. Check cutting teeth before operating and familiarize yourself with equipment controls and their functions.
6. Never attempt to start or operate the machine except from the operator’s station.
7. Operators and passengers (equipment with passenger seating) shall wear seat belts and/or shoulder harnesses as provided.
8. Never stand behind or in front of the machine when the engine is being started or grinding pavement. Grinders may lunge rearward unexpectedly.
9. Always use two employees when loading or unloading equipment. When preparing for transport, place block of wood under grinder head after equipment is loaded on trailer.
10. Before adjusting, lubricating or fueling the equipment, move the grinder drum engagement lever to the off position, set the brake, shut off the engine and block the wheels if on an incline.
11. Always come to a complete stop and stop grinder head before reversing the direction of the machine while grinding.
12. Always use caution when turning or crossing near traffic. The machine moves slowly and requires more time to maneuver than other equipment.
13. Always align the rear wheels with the frame when deadheading the machine.
14. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
15. Keep machine clean.
16. Always use water when grinding and milling.
17. Stay clear of all moving parts, cables, shafts belts, flywheels, etc.
18. When in operation, only the operator shall be permitted on the machine.
19. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
20. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
21. The equipment should be equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant (cleaning agents/soaps/detergents).
22. This task is included in NCDOT Silica Exposure Control Plan.
23. If water suppression is not used, a particulate respirator of assigned protection factor (APF) 10 or better based on risk assessment must be used.

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Paving Machine/Widener SOP 12A-14

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</table>

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Proper use of cleaning agents is imperative.
4. One person only shall direct truck drivers backing into or leaving paver.
5. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from equipment.
6. Never attempt to start or operate the machine except from the operator’s station.
7. Be aware of hot places on paver to avoid burns.
8. Do not leave paver unattended when heating screed.
9. Use caution when loading/unloading paver from trailer, especially in wet or damp conditions.
10. When transporting paver or trailer, check to be sure load is properly secured.
11. Be aware of fire extinguisher locations on equipment and make sure they are properly charged.
12. When transporting oversize loads, operator should obtain proper permit.
13. Stay clear of all moving parts, cables, shafts, belts, flywheels, etc.
14. Operators should be aware of employees and others on foot in work zones.
15. Use caution when handling hot/flammable materials. Review MSDS’s for each material used.

Related SOP’s

General SOPs ...........................................Chapter 10  Truck, Dump ...........................................12A-30
Rollers, Patch ...........................................12A-16
SAFE OPERATING PROCEDURES

Post Driver SOP 12A-15

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Required Personal Protective Equipment (PPE)

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<tbody>
<tr>
<td>Safety Shoes</td>
<td>Hard Hat</td>
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</table>

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
4. Stay clear of all moving parts, cables, shafts, belts, flywheels, etc.
5. Travel slowly when moving over rough terrain.
6. Never drive too close to the edge of a ditch or excavation.
7. Watch for overhead wires.
8. Reduce speed before turning or applying brakes. Couple the brake pedals together when traveling at high speed. Be sure that both wheels are braked simultaneously when making an emergency stop.
9. Never attempt to start or operate the machine except from the operator’s station.
10. Keep all persons away from unit when it is in operation.
11. Watch for debris when driving wooden posts.
12. Keep posts plumb and firmly attached.
13. Operators and passengers (equipment with passenger seating) shall wear seat belts and/or shoulder harnesses as provided.
14. When in operation, only the operator shall be permitted on the machine.
15. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.

Related SOP’s

General SOPs ...........................................Chapter 10 Tractor, Wheel ...........................................12A-25
SAFE OPERATING PROCEDURES

Patch Rollers

Hazard Review

Rollover Towing
Mounting/Dismounting Traffic
Hooking/Unhooking

Required Personal Protective Equipment (PPE)

Safety Vest Safety Shoes Safety Glasses
Hearing Protection

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Never attempt to start or operate the machine except from the operator’s station.
4. Remain in seat while operating. Wear seat belt if equipped with rollover protection.
5. When mounting or dismounting equipment, use steps and hand holds provided. Do not jump from equipment.
6. Choose safest location to park equipment. Avoid parking in other equipment’s blind spot.
7. When in operation, only the operator shall be permitted on the machine.
8. Use caution when operating roller on steep grades.
9. Keep area clear when operating roller. Be aware of location of any stationary objects in area.
10. Always completely stop roller before changing directions.
11. Operator should be aware of employees and others on foot in work zones.
12. Do not allow anyone to get between roller and truck while coupling.
13. When rolling patches or edges, do not get too close to edge of pavement to avoid rollover.
14. Hook and unhook patch rollers on stable ground. Use a guide when hooking to vehicle. Set parking brake on roller to prevent bending hydraulic tongue. Chocks should be used on slopes.
15. Use locking pins when wheels are in up or down position.
16. After disconnecting, both roller drums should be on ground.
17. Use caution when loading/unloading steel wheel roller from trailer especially in wet or damp conditions.
18. When transporting roller on trailer, check to be sure load is properly secured.
19. Observe recommended towing speed limit of the machine.
20. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
21. Operator should be aware of employees and others on foot in work zones.

Related SOP’s

General SOPs...........................................Chapter 10 Trucks, Crew Cab and Flatbed.........................12A-29
Trucks, Dump ......................................12A-30 Trailers and Towed Equipment.....................12B-30
SAFE OPERATING PROCEDURES

Rollers, Sheep Foot/Rubber-Tired/Vibratory

Hazard Review

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Required Personal Protective Equipment (PPE)

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<td>Hearing Protection</td>
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</table>

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Remain in seat while operating. Wear seat belt if equipped with rollover protection.
4. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from equipment.
5. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spot.
6. When in operation, only the operator shall be permitted on the machine.
7. Use caution when operating roller on steep grades and fill edges.
8. Keep area clear when operating roller. Be aware of location of any stationary objects in area.
10. Operator should be aware of employees and others on foot in work zones.
11. Use guide when hooking towed sheep foot or vibratory roller to tractor. Check pin and coupling for wear.
12. Never attempt to start or operate the machine except from the operator’s station.
13. Check sheep foot roller periodically and remove roots, wire, rock, etc. caught between feet.
14. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
15. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
16. Make sure equipment is properly secured prior to transporting.

Related SOP’s

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Roller, Sheep Foot/Rubber-Tired/Vibratory– SOP 12A-17
SAFE OPERATING PROCEDURES

Rotary Slope Mower

Hazard Review

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Required Personal Protective Equipment (PPE)

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<tr>
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<th>Safety Shoes</th>
<th>Safety Glasses</th>
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<td>Hearing Protection</td>
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</table>

1. Supervisors shall verify that operators are capable and qualified on equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
4. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
5. When operating grader, be aware of protruding or overhanging objects or limbs.
6. When traveling, make sure that mower is properly positioned.
7. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
8. Be on the lookout for hazards in or adjacent to the travel way such as bridges, signs and utilities.
9. Operators and passengers (equipment with passenger seating) shall wear seat belts and/or shoulder harnesses as provided.
10. Operators shall be aware of employees and others within work zone.
11. When in operation, only the operator shall be permitted on the machine.
12. Operators shall never allow machine to coast downhill with transmission in neutral.
13. Periodically check blades and mower side shield. Do not leave attachments in raised position when it is not in use. Always lower to the ground.
14. Check work area for debris and utility pedestals the cutter might hit or pick up.
15. Always cut machine off when servicing or dismounting grader. Failure to do so may result in serious bodily injury. All safeguards are to be in place and secure.
17. Transport cutter with the head in transport position.
18. Watch for overhead clearances.
19. Operate with cutterhead away from operator’s cab whenever possible so that operator will be looking at top of mower deck rather than underside of mower.

Related SOP’s

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Rotary Slope Mower – SOP 12A-18
SAFE OPERATING PROCEDURES

Scraper SOP 12A-19

Hazard Review

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Required Personal Protective Equipment (PPE)

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<th>Safety Shoes</th>
<th>Safety Glasses</th>
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<td>Hearing Protection</td>
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</table>

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
3. When mounting or dismounting equipment use steps and handholds provided. Do not jump from vehicle.
4. Operators shall wear seat belts and/or shoulder harnesses as provided.
5. Keep windshield, windshield wipers, side windows and mirrors clean.
6. Make visual inspection of work area before starting operations.
7. When in operation, only the operator shall be permitted on the machine.
8. Stop scraper with brakes, not transmission.
9. Do not operate the scraper or controls from any position other than the operator’s seat.
10. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
11. Operators should be aware of employees and others in work zones.
12. When using self-propelled scraper, attention by both the operator and dozer operator to protect against personal injury and equipment damage should be exercised. Close communication between the operators before and during the job is necessary.
13. When using self-loading scraper, no one should approach the paddles while motor is running.
14. When parking, set parking brakes, lock transmission and place bowl on ground. Turn off switch and remove key. Properly secure equipment.
15. When operating machine on side slope, never allow anyone to remain downslope while machine is in motion.
16. Speed should be adjusted for load and conditions.
17. Operators should make a visual inspection of work area prior to beginning work.

Related SOP’s

- General SOPs ........................................ Chapter 10  Rollers, Sheepfoot/Rubber-Tired/Vibratory .. 12A-17
- Crawler Tractor ....................................... 12A-23

Scraper – SOP 12A-19
<table>
<thead>
<tr>
<th>Author:</th>
<th>Doug McConnell</th>
<th>Revision #:</th>
<th>1</th>
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<tbody>
<tr>
<td>Approved by:</td>
<td>Len Sanderson</td>
<td>Date Issued:</td>
<td>October 1, 2004</td>
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SAFE OPERATING PROCEDURES

Snooper Crane

Hazard Review

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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</table>

1. Follow all manufacturers’ guidelines for this under bridge inspection equipment.
2. Operators shall review Safe Operating Procedures for applicable equipment and perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
4. Ensure proper lane or shoulder closure procedures are used.
5. Do not operate boom within 20 feet of power lines.
7. Never exceed maximum lifting capacity of boom in its different positions. Refer to load chart.
8. Only one person shall operate the boom, and only one person shall signal and assist the operator.
9. Check and use outrigger safety locks and warning lights. Keep outriggers in sight while lowering.
10. Do not operate boom unless outriggers are down. Do not use outrigger for lifting.
11. When swinging boom, change directions slowly. Do not rock the boom.
12. Operators should be aware of employees and others on foot in work zones.
13. When working in bucket, hard hats and safety harnesses must be worn. Use PFD when working over water.
14. Safety harness must be worn and lanyard or restraint attached when in the buckets.
15. All unauthorized personnel shall be kept clear of the operation.
16. Workers shall not be allowed under boom during operation.
17. Check load capacity of the bridge before operating a snooper crane from the deck.
18. All drivers shall be properly licensed.
19. Keep windshield, windshield wipers, side windows and mirrors clean.
20. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion unless the vehicle is designed to accommodate an individual outside the cab.

21. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.

22. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.

23. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.

24. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard, and life line.

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SAFE OPERATING PROCEDURES

Spreader, Aggregate

Hazard Review

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Required Personal Protective Equipment (PPE)

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<tr>
<td>Hearing Protection</td>
<td>Safety Glasses</td>
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</table>

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Follow factory instructions when installing or removing the spreader hopper. Avoid pinch points and make sure chains and hooks are properly positioned.
3. Two operators shall be used to operate spreader. No person or operator is to ride in or on the front hopper or spreader box.
4. Material feed belts should be checked for centering, adjustment and condition.
5. When the spreader is being moved from one location to another job-site (deadheading) only the operator shall ride on the spreader.
6. Deadhead spreader with hopper empty or no more than one-quarter full.
7. Check for proper function of all electrical switches and hydraulic valves prior to receiving first load of material.
8. Coordination between operators and truck drivers is essential. A pre-job discussion concerning truck flow patterns will increase efficiency and reduce accident potential by minimizing long distance backing. One person shall be designated to direct truck drivers.
9. Caution shall be used when starting and stopping on grades.
10. Operators should be aware of employees and others on foot in work zones.
11. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
12. Before cleaning debris from rear hopper, conveyor belts, front hopper screen or adjusting or cleaning front hopper gates, stop the spreader, lock the parking brake, and shut off both conveyors, spreadroll and agitator.
13. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
14. Use caution when installing or removing spreader hopper. Properly secure load. Avoid pinch points.
15. Operate the spreader using the existing workstations and staying within areas protected by guardrails. Guardrails shall be 42 inches high with midrail and toe board.
16. Chain on guardrails shall be in place during operation.
17. Make sure equipment is properly secured prior to transporting.
18. Do not leave loose objects lying on spreader.
19. When transporting oversize loads, operator should obtain proper permit.
20. Operators and passengers (equipment with passenger seating) shall wear seat belts and/or shoulder harnesses as provided only if rollover protection is provided.

21. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.

22. Stay clear of both front and rear hoppers and all moving parts, cables, shafts, belts, flywheels, etc.
SAFE OPERATING PROCEDURES

Tractor, Backhoe and Loader

Hazard Review

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**Required Personal Protective Equipment (PPE)**
*(Based on job specific hazard review)*

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1. Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Drivers shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
3. Operators shall wear seat belts and/or shoulder harnesses as provided.
4. Keep windshield, windshield wipers, side windows and mirrors clean. Make sure that the mirrors provide a large as possible view of the rear.
5. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
6. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
7. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots.
8. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged and that the monthly inspection tag has been initialed.
9. Operators should be aware of employees and others on foot in work zones and be sure area is clear of personnel before lowering stabilizers or moving the boom.
10. Do not leave attachments in the raised position when equipment is not in use; always lower to the ground.
11. When in operation, only the operator should be permitted on the machine.
12. Be sure outriggers are properly set before operating backhoe.
13. Never allow anyone to work under a raised bucket.
14. Do not operate backhoe boom within 20 feet of energized power line.
15. Utilize trailer whenever possible to transport backhoe. Use swing and boom locking pins when transporting.
16. Make sure equipment is properly secured prior to transporting with (4) independent tie downs and a chain or strap across the lowered bucket.
17. Before digging, review excavating, trenching and shoring guidelines found in Chapter 11E.
18. When operating on slopes, use caution when swinging bucket in the downhill direction. Dump on the uphill side. Keep loader bucket low when moving.
19. Select loading areas that are as level as possible.
20. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
21. To eliminate silica dust exposure, the operator should remain in the cab of the equipment with the door closed. Cabs should be kept as dust free as possible and wet cleaned when needed. Cabs must be filtered; door seals and door closing mechanisms should work properly with heating and cooling capabilities

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SAFE OPERATING PROCEDURES

Tractor, Crawler  SOP 12A-23

Hazard Review

Mounting/Dismounting  Backing  Inclement Weather  Steep Terrain

Required Personal Protective Equipment (PPE)

Safety Vest  Safety Shoes  Hard Hat

1. Supervisors shall verify that operators are capable and qualified on equipment before allowing the equipment to be operated.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
4. Operator should make a visual inspection of work area prior to beginning work.
5. When in operation, only the operator should be permitted on the machine.
6. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
7. Never allow machine to coast downhill with transmission in neutral.
8. When involved in clearing operations, operator should be conscious of possible falling debris from overhead. An observer shall be used when visibility is obstructed.
9. Operator should lower ripper and blade to the ground, set foot brake and lock transmission whenever machine is parked.
10. When operating on a side slope, never allow anyone to remain down slope while machine is in motion.
11. Operators and passengers (equipment with passenger seating) shall wear seat belts and/or shoulder harnesses as provided.
12. Operator should be aware of employees and others in the work zone.
13. Never attempt to start or operate the machine except from the operator’s station.
14. Make sure equipment is properly secured prior to transporting.
15. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spot.
16. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.

Related SOP’s

General SOPs ............................................Chapter 10  Trailers and Towed Equipment .................12B-30
SAFE OPERATING PROCEDURES

SOP 12A-24

Tractor, Mower

Hazard Review

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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<tr>
<td>Gloves</td>
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1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Watch traffic when driving around guide markers, signs, culverts, etc. or any time machine encroaches on travel lane.
4. Don’t mow too close to fences and be alert for utility pole guy wire, concrete right of way markers, etc.
5. Use caution when mowing on steep slopes. Watch for hidden holes or washouts and reduce speed.
6. Use caution when mowing downhill on wet or green grass, as brakes are less effective.
7. Shut off tractor when performing equipment repair activities.
8. Keep area clear of personnel on foot.
9. Do not dismount unless motor is off, blades have stopped and brake is set.
10. Never work under mower unless properly secured with safety stand or safety chain.
11. Keep mower adjusted to proper height above ground to prevent throwing debris.
12. Do not run side mount flail in the up position.
13. Replace missing flail knives to maintain balance.
14. Ensure debris guard is in place and in good condition.
15. Use caution not to place equipment in locations where it is subject to getting stuck.
16. Never attempt to start or operate the machine except from the operator’s station.
17. Operators and passengers (equipment with passenger seating) shall wear seat belts and/or shoulder harnesses as provided.
18. Stay clear of all moving parts, cables, shafts, belts, flywheels, etc.
19. Check frame for cracks and loose bolts.
20. Mower operators should familiarize themselves with this section.

Related SOP’s

General SOPs ..........................................Chapter 10 Tractor, Wheel .................................................12A-25
SAFE OPERATING PROCEDURES

Tractor, Wheel SOP 12A-25

Hazard Review

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<tr>
<td>Crushing/Pinching</td>
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Required Personal Protective Equipment (PPE)

| Safety Vest | Safety Shoes | Gloves |

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
3. Do not leave attachments in the raised position when they are not in use. Always lower to the ground.
4. When operating vehicle off of the roadway, be aware of hidden objects in the grass and unstable terrain.
5. Never allow anyone to work under raised attachments without proper safeguards in place and secured.
6. Avoid driving too close to the edge of a ditch, shoulder or excavation.
7. Reduce speed before turning or applying brakes. Couple the brake pedals together when traveling at high speed. Be sure that both wheels are braked simultaneously when making an emergency stop. Drive at speeds slow enough to ensure your safety, especially over rough ground.
8. When driving out of a ditch, gully, or up a steep slope, engage the clutch slowly. Be prepared to de-clutch promptly if the front wheels rise off the ground. Use the same care if rear wheels mire in soft ground or drop into hole. Back the unit out of these spots if at all possible.
9. Never attempt to start or operate the machine except from the operator’s station.
10. Protect PTO drive with master guard and shield.
11. Do not oil, grease, or adjust the unit while it is in motion.
12. Operators must wear lap belt and/or shoulder harness if rollover protection is provided.
13. Supervisors shall verify operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
14. When in operation, only the operator shall be permitted on the machine.
15. Never coast or freewheel downhill.
16. Stay clear of all moving parts: shafts, belts, flywheels, fans, etc.
17. Be aware of crushing or pinching hazards when hooking up, using, adjusting or removing attachments.
18. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
19. Keep windshield, windshield wipers, side windows and mirrors clean.
20. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
21. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spot.
22. Check frame for cracks and loose bolts.
23. Make sure equipment is properly secured prior to transporting.
# SAFE OPERATING PROCEDURES

## Truck, Aerial Device

### Hazard Review

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### Required Personal Protective Equipment (PPE)

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1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Drivers shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and/or shoulder harnesses as provided.
5. Keep windshield, windshield wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion unless the vehicle is designed to accommodate an individual outside the cab. However, a traffic control technician is allowed to be in the bucket, with the bucket fully down, while the driver moves the vehicle from one signal head to another within the same intersection.
8. Whenever an individual is elevated in an aerial truck, there should be a second individual on the ground that has the ability to render aid and assistance if necessary. The second individual may be someone other than a NCDOT employee provided they have been trained in first aid and are instructed on the emergency operation of the aerial device.
9. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
10. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots.
11. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
12. Operators should be aware of employees and others on foot in work zones.
13. Be aware of crushing and pinching hazards when using boom.
14. Make sure cargo is properly loaded and secured. Check to make sure boom is secure before traveling.
15. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.

Truck, Aerial Device—SOP 12A-26
16. Always engage vehicle-parking brakes and use wheel chocks before operating aerial device.
17. Operator should watch the bucket and boom when beginning boom operation to prevent collision with obstructions.
18. Never exceed the rated load capacity for bucket.
19. When operating vehicle off the roadway be aware of hidden objects in the grass and unstable terrain.
20. When in bucket, wear a safety harness and lanyard connected to an approved anchorage.
21. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
22. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.
23. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.
SAFE OPERATING PROCEDURES

Truck, Asphalt Patcher

Hazard Review

Traffic Mounting/Dismounting Backing
Hot Asphalt Lifting

Required Personal Protective Equipment (PPE)

Safety Vest Safety Shoes Gloves
Safety Glasses/Goggles

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. All drivers shall be properly licensed.
4. Never wear loose clothing that can get entangled in the working parts of the tools.
5. Maintain proper footing and balance at all times.
6. Operator should be aware of employees and others on foot in work zones.
7. Disconnect all equipment before inspecting or servicing.
8. Always connect hoses to the tool hose couplers before energizing the hydraulic power source.
9. Do not operate the tool at oil temperatures above 140 degrees F.
10. Do not weld, cut with an acetylene torch or hardface the breaker tool.
11. Be sure that all hoses and attachments are put back in truck and properly secured before moving.
12. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
13. Use caution when handling hot/flammable materials. Review MSDS for each material used.
14. Use proper lifting and handling techniques while shoveling asphalt.
15. Take extra precautions to prevent heat and cold stress when working in extremely hot or cold temperatures.
16. Operators and passengers (equipment with passenger seating) shall wear seat belts and/or shoulder harnesses as provided.
17. Keep windshield, windshield wipers, side windows and mirrors clean.
18. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
19. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
20. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.

Related SOP’s

General SOPs.....................................Chapter 10 Truck, Dump..............................12A-30
Rollers, Patch.....................................12A-16 Hand Tools (Power and Manual)..........12B-13

Truck, Asphalt Patcher– SOP 12A-27
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SAFE OPERATING PROCEDURES

Truck, Crane

Hazard Review

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Required Personal Protective Equipment (PPE)

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1. All drivers shall be properly licensed.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
4. Do not operate boom within 20 feet of power lines.
5. Check boom and boom hook daily for cracks, deformities, oil leaks or loose pins, nuts and bolts.
6. Make a daily check of wire rope, cable or chains for deformities.
8. Never exceed maximum lifting capacity of boom in its different positions. Refer to load chart.
9. Only one person shall operate the boom and only one person shall signal and assist the operator.
10. Check and use outrigger safety locks and warning lights. Do not use outrigger for lifting. Keep outriggers in sight while lowering.
11. Do not operate boom unless outriggers are down.
12. Use timber under outriggers for support when operating on soft ground.
13. When swinging boom, change direction slowly. Do not rock boom and always use a straight pull. Do not use boom to push or boom swing to pull.
14. Do not pull objects directly toward operator position; use remote control for the boom.
15. Do not use chain and grab hooks.
16. Operators and passengers (equipment with passenger seating) shall wear seat belts and/or shoulder harnesses as provided.
17. Keep windshield, windshield wipers, side windows and mirrors clean.
18. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
19. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
20. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
21. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spot.
22. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.

Related SOP’s

General SOPs .......................................Chapter 10   Rigging.......................................................11E-9
SAFE OPERATING PROCEDURES

Truck, Crew Cab and Flatbed SOP 12A-29

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**Required Personal Protective Equipment (PPE)**

| Safety Vest | Safety Shoes | Gloves |

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Drivers shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and/or shoulder harnesses as provided.
5. Keep windshield, wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab or vehicle is being used with mulch blower.
8. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots.
10. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
11. Operators should be aware of employees and others on foot in work zones.
12. Make sure cargo is properly loaded and secured with no less than two chains. Hauled vehicles shall be secured with chains pulling from opposite directions. Check for loose material on truck body and chassis.
13. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
14. When operating vehicle off the roadway, be aware of hidden objects in the grass and unstable terrain.
15. Provisions should be made for proper tool and sign storage.
16. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
17. Only approved chain and load binders shall be used.
18. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.

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Truck, Crew Cab and Flatbed – SOP 12A-29
SAFE OPERATING PROCEDURES

Truck, Dump

Hazard Review

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

| Safety Vest | Safety Shoes | Gloves |

1. All drivers shall have proper CDL.
2. Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Drivers shall perform a pre-operational check of their equipment and maintain in truck. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and or shoulder harnesses as provided.
5. Keep windshield, windshield wipers, side windows and mirrors clean. Ensure tailgates are clean, brake lights and backup lights. Review frequently during snow and ice events and when handling muddy loads.
6. When mounting or dismounting equipment, use steps and handholds provided using the 3 points of contact while facing equipment. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
8. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots and maintain a safe distance to allow for other vehicles to move in and out.
10. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged. Make sure the sight glass is clear and visible with no visible rust on the extinguisher.
11. Inspect and initial monthly inspection tag for fire extinguisher.
12. Check supplies in the first aid kit on monthly basis.
13. Operators should be aware of employees and others on foot in work zones.
14. Always be aware of distracted drivers and use defensive driving skills as needed.
15. Be aware of crushing and pinching hazards when installing, adjusting or removing tailgates. Get help or use machinery as necessary.
16. Make sure cargo is properly loaded, secured and covered. Check for loose material on bed rails and chassis.
17. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
18. Know the height of the vehicle with load prior to driving in case you have to travel under bridges with less than 13’ 6” clearance.
20. Be aware of overhead power and utility lines when spreading material.
21. When operating vehicle off of the roadway, be aware of hidden objects in the grass and unstable terrain.
22. Never work under bed when raised without proper bracing in place.
23. Make sure tailgate is unlatched prior to raising bed for dumping and avoid dumping on uneven side of hill terrain.
24. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.
25. Properly hang all electrical cords used for engine block heaters on post when disconnected from the truck. Do not place the cord on the ground where rain and puddles may form causing a short circuit or energize the ground.
26. When operating trucks with a salt brine tank, salt spreader or other bed mounted equipment secure the load using cross strapping on the sides (front to back, back to front) and one across the rear to prevent forward and backward movement.
27. All items in the cab areas of the vehicle should be removed or secured in toolboxes. Because of extreme vehicle temperature, items such as aerosol cans or any items whose contents are under pressure should not be carried inside the cab area of the vehicle.

**Related SOP’s**

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SAFE OPERATING PROCEDURES

Truck, Field Mechanic

Hazard Review

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Required Personal Protective Equipment (PPE)

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1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and shoulder harnesses as provided.
5. Keep windshield, wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion.
8. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spot.
10. Be aware of fire extinguisher locations and make sure they are properly charged.
11. Operators should be aware of employees and others on foot in work zones.
12. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
13. When operating vehicle off the roadway, be aware of hidden objects in grass and unstable terrain.
14. Do not smoke around flammable liquids.
15. Remove regulator valves and install tank caps on oxygen and acetylene tanks when transporting.
16. Make sure cargo is properly loaded and secured. Check for loose material on truck body and chassis.
17. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
18. Field mechanic’s truck and equipment being serviced should be completely off roadway. If this is not possible, determine traffic control needs from Work Zone Safety Handbook.

Related SOP’s

- General SOPs ........................................ Chapter 10
- Hand Tools (Power and Manual) ............. 12B-13

Truck, Field Mechanic’s – SOP 12A-31
SAFE OPERATING PROCEDURES

Truck, Fuel and Lube

Hazard Review
- Traffic
- Mounting/Dismounting
- Backing
- Flammable Liquids

Required Personal Protective Equipment (PPE)
- Safety Vest
- Safety Shoes
- Gloves
- Safety Glasses/Goggles

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Drivers shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and shoulder harnesses as provided.
5. Keep windshield, wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
8. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spot.
10. A reflective vest is required when servicing vehicles on shoulder of road.
11. Be aware of fire extinguisher locations and make sure they are properly charged.
12. Operators should be aware of employees and others on foot in work zones.
13. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
14. When operating vehicle off the roadway, be aware of hidden objects in grass and terrain.
15. Do not smoke while fueling equipment.
16. Immediately use electrical quick disconnect should accident occur.
17. Lube truck and equipment being serviced should be completely off the roadway. If this is not possible, determine traffic control needs from Work Zone Safety Handbook.
18. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
19. Operator shall stop at all unsignalized railroad grade crossings.
20. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.

Related SOP’s
General SOPs................................................. Chapter 10
SAFE OPERATING PROCEDURES

Truck, Geotechnical and Trailer 

SOP 12A-33

Hazard Review

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Required Personal Protective Equipment (PPE)

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1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be used unsupervised.
3. Drivers shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual.
4. Operators and passengers shall wear seat belts and/or shoulder harnesses as provided.
5. Keep windshield, windshield wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Be sure back-up alarms are working properly.
8. Choose safest location possible to park equipment. Avoid parking in blind spots of other equipment.
9. Be aware of fire extinguisher locations on equipment and make sure that they are properly charged.
10. Operators should be aware of employees and others on foot in work zones.
11. Be aware of crushing and pinching hazards when loading, unloading and fastening down equipment.
12. Make sure cargo is properly loaded, secured and covered using only approved chain and load binders. Check for loose material on bed and trailer.
13. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
14. Operators should always check and be sure of load height.
15. When operating vehicle off the roadway, be aware of hidden objects in the grass and unstable terrain.
16. Periodic checks of equipment on long trips may be necessary to assure load is secure.
17. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
18. Hook/unhook, load/unload on stable ground with trailer secure.

Related SOP’s

General SOPs .................................................Chapter 10 
Truck, Tractor and Trailer.................................12A-36
Trailers and Towed Equipment....................12B-30
SAFE OPERATING PROCEDURES

Truck, Herbicide  SOP 12A-34

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Required Personal Protective Equipment (PPE)

| Safety Vest | Safety shoes | Eye Protection |
| Hearing protection | Respirator | Protective clothing |

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers and operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Drivers and operators shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Watch for side clearance and conflict with fixed or moving objects while using or adjusting boom. Properly secure boom while not in use.
5. Check packing glands on agitator shafts for leaks.
6. Avoid splashing. Do not overfill tank. Test pump and system and calibrate before adding chemical.
7. Check frame for cracks and loose bolts.
8. Chemical containers must be labeled and spray trucks must have labels in the cab area.
9. Safety shutoff valves shall be installed on all outlets.
10. Use proper loading, mixing and application procedures according to labels. Apply tank mix to target areas only.
11. Handle spills according to label directions.
12. Operators and passengers shall wear seat belts and/or shoulder harnesses as provided.
13. Keep windshield, windshield wipers, side windows and mirrors clean.
14. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
15. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is engaged in normal work operation, i.e. herbicide spraying, blowing mulch, etc.
16. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
17. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots.
18. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
19. Operators should be aware of employees and others on foot in work zones.
20. Be aware of overhead utility lines when spreading material.
21. When operating vehicle off of the roadway, be aware of hidden objects in the grass and unstable terrain.

22. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.

23. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.

**Related SOP’s**

General SOPs ........................................ Chapter 10
SAFE OPERATING PROCEDURES

Truck, Sign Erector (With Sign Erection Attachment)

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Required Personal Protective Equipment (PPE)

| Safety Vest | Hardhat | Safety shoes |
| Safety Glasses | Gloves | Hearing protection |

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and/or shoulder harnesses as provided.
5. Keep windshield, windshield wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
8. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots.
10. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
11. Operators should be aware of employees and others on foot in work zones.
12. Make sure cargo is properly loaded and secured.
13. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
14. When operating vehicle off of the roadway, be aware of hidden hazards and unstable terrain.
15. Always set the vehicle emergency brake before beginning crane operation, extend outrigger and use wheel chocks on grades.
16. Never operate the crane near power lines.
17. Always shut the engine off before working on or near P.T.O. system.
18. When operating auxiliary hydraulic equipment, follow manufacturer’s guidelines. Never use uninsulated tools near electrical lines.
19. Keep work area clean to avoid stumbling or falling.
20. Be aware of and keep hands and feet clear of pinch points.
21. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
SAFE OPERATING PROCEDURES

Truck, Tractor and Trailer

Hazard Review

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Required Personal Protective Equipment (PPE)

| Safety Vest | Safety Shoes | Gloves |

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Drivers shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and/or shoulder harnesses as provided.
5. Keep windshield, windshield wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion, unless the vehicle is designed to accommodate an individual outside the cab.
8. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots.
10. Be aware of crushing and pinching hazards when installing, adjusting or removing chains and binders used to secure loads.
11. Make sure cargo is properly loaded and secured using only approved chain and load binders. Use no less than two chains. Hauled vehicles shall be secured with chains pulling from opposite directions.
12. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
13. Drive defensively, observe speed limits and obey all traffic laws.
14. When transporting oversize loads, operator shall be responsible for obtaining proper permit.
15. Operator should always check and be aware of load height.
16. Hook/unhook, load/unload on stable ground with trailer secure.
17. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.
18. Make sure appropriate decals and placards are displayed on vehicles.
19. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
20. If vehicle is equipped with A.C. engine heater, first switch current off and then unplug heater before getting into vehicle.
SAFE OPERATING PROCEDURES

Work Boat SOP 12A-37

Hazard Review

Drowning     Slip, Trip and Fall     Lifting
Flammable Materials  Adverse Weather  Unsecured Objects
Pinch Points/Crushing Injuries

Required Personal Protective Equipment (PPE)

Personal Flotation Device (PFD)

BEFORE LAUNCHING
1. Check weather forecast prior to leaving dock.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
4. U.S. Coast Guard minimum requirements for boats are to have U.S. Coast Guard approved fire extinguisher, bell/whistle, PFD’s for all passengers, and a visual distress signal. In addition boat must be equipped with a first aid kit, boat hooks, paddles, mooring/anchor lines, flashlight, and fenders.
5. Brief new personnel on safety equipment use and location.
6. Make sure drain plugs are in place.
7. Have sufficient fuel on board for trip. When fueling, switch off engines, do not use electrical switches, extinguish all open flames and avoid overflow.
8. Be sure bow line is attached to bow and secured before backing down launch ramp.
9. When applicable, make radio check with shore facility when working from boat.
10. Make a visual check of hull for rips, tears or holes.

AFTER LAUNCHING
11. Monitor weather for changing conditions.
12. Check for water leakage from hull or engine.
13. Control speed and obey all speed limit signs. Manage wake at all times.
14. Observe maritime “Rules of the Road”.

BOAT TRAILER
15. Back up to trailer with assistance of another person.
16. Check condition of hitch, safety chain, electrical lines, winch and winch cable.
17. Make sure winch is in locked position before moving trailer and boat.
18. Check for proper alignment of boat on rollers and V-block.
19. Check condition of trailer wheels and brakes.
20. Be sure boat is secure before moving.

Related SOP’s
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SAFE OPERATING PROCEDURES

Wrecker SOP 12A-38

Hazard Review

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</table>

1. All drivers shall be properly licensed.
2. Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
4. Operators and passengers shall wear seat belts and shoulder harnesses as provided.
5. Keep windshield, wipers, side windows and mirrors clean.
6. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
7. No personnel shall be allowed to ride anywhere, except in the cab, when the vehicle is in motion.
8. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
9. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spot.
10. Do not overload truck, and always use proper engine speed and gear ratio.
11. Never travel with the power-take-off control engaged.
12. When the boom is raised, never put the selector in the down position and let go of the crank. A runaway crank would result. Never use the crank when the boom has a load on it.
13. Never disengage the wrecker service drum engagement control when the cable is loaded.
14. Never apply lubricant or perform any kind of maintenance while wrecker equipment is operating.
15. Always unlatch the hood of the disabled vehicle when lifting its front end. Leave the safety catch engaged.
16. Always turn on flashing lights in traffic when towing disabled equipment.
17. Stay clear of all moving parts, cables, shafts, belts, flywheels, etc.
18. Truck speed should be adjusted for load and weather. Tire chains should be utilized as dictated by weather conditions.
19. Be aware of fire extinguisher locations on your equipment and make sure they are properly charged.
20. If disabled equipment cannot be removed from roadway, then determine traffic control needs from the Work Zone Safety Handbook.
21. Operators should be aware of employees and others on foot in work zones.
22. Check boom daily for cracks, deformities, oil leaks or loose pins, nuts and bolts.
23. Do not leave equipment unattended with the engine running. Shut off engine and set the parking brake when equipment is not in use.

Related SOP’s
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SAFE OPERATING PROCEDURES

Truck Mounted-Scissors Lift  
SOP 12A-39

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1. All drivers shall be properly licensed.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment. Report all needed repairs promptly. Do not use any equipment that is unsafe. Operators will follow all manufacturer’s recommendations and operating instructions.
4. If vehicle is equipped with an AC engine heater, first switch off current and then unplug heater before getting into vehicle.
5. Truck operators and passengers shall wear safety belts and/or shoulder harnesses as provided.
6. Keep windshield, windshield wipers, side windows and mirrors clean.
7. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
8. No personnel shall be allowed to ride anywhere except in cab when vehicle is in motion.
9. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer for guidance, when available.
10. Ensure backup alarm and platform alarms (if so equipped) are working properly.
11. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spots.
12. Do not travel to any location with the lift in an elevated position.
13. Operators shall be aware of employees and others on foot in work zones.
14. Do not stand or sit on guardrails.
15. For inclement weather, truck speed should be adjusted for the load and road condition.
16. Be aware of utility lines and other overhead dangers when raising platform.
17. Do not raise lift if on uneven or soft surfaces. Always place stabilizers before raising lift.
18. Employees should be aware of the crushing/pinching hazards when opening lift entry gates.
19. Stay off hills and slopes too steep for safe operation.
20. Do not leave equipment unattended with the engine running. Shut off engine and set the parking break when not in use. Chock wheels before raising lift. Do not stand next to lift when it is in operation. Use cab controls for lowering and raising lift.
21. Do not sit or reach into bed of scissor lift when it is in an elevated position.
22. Operators and employees shall not stand or walk between the truck and other equipment.

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Truck Mounted-Scissors Lift-12A-39
SAFE OPERATING PROCEDURES

Deadheading SOP 12A-40

### Hazard Review

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### Required Personal Protective Equipment (PPE)

(Based on job specific hazard review)

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### Definitions:

Deadheading equipment refers to moving heavy slow equipment that is not capable of highway speeds from work zone to work zone for the purpose of repositioning the equipment. It can also apply to moving heavy slow equipment within large work zones.

Examples of equipment types that are routinely deadheaded are wheel tractors, motor graders, loaders, backhoes, mowing tractors, rollers, and broom tractors. Typically, this equipment cannot travel more than 25 MPH, well below posted speed limits on highways and roads.

It is recognized that vehicles traveling at speeds that greatly differ can present a hazard to each other. To mitigate this hazard, the following Safe Operating Procedures are recommended:

1. Follow all manufacturers’ guidelines.
2. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
3. Supervisors shall verify that the equipment operator is capable and qualified with the equipment to be deadheaded.
4. The Supervisor shall verify that the equipment operator is familiar with the route’s physical characteristics (road alignment, steep grades, location of potential pull outs), and the route’s traffic characteristics for the day and time of the move. Every effort should be made to avoid peak traffic periods.
5. Impacts to visibility due to weather, especially fog and rain, should also be considered in determining if deadheading is safe.
6. No deadheading is permitted on interstates and other fully access controlled highways except for extreme emergencies.
7. Deadheading should be avoided on routes where the prevailing speeds are 45 MPH or greater. Lower volume routes should be selected if multiple feasible routes exist.
8. While deadheading, the operator should utilize pullouts periodically to allow faster vehicles to pass and avoid driver frustration.
9. All flashers and warning lights must be operational during deadheading. Slow Moving Vehicle emblems are required on deadheading equipment.
10. Use of a Shadow Vehicle, for the purpose of providing enhanced lighting of the slow moving equipment, should be considered. If the equipment to be deadheaded has good warning lighting, the Shadow Vehicle is not necessary and creates an additional hazard to other vehicles attempting to pass.

11. When a Shadow Vehicle is used, a temporary sign on the back stating “Slow Moving Vehicle Ahead” shall be used. The minimum size for the sign is 42 inches wide and 20 inches high.

12. Seat belts must be worn while deadheading.

13. Implements on tractors must be locked while deadheading. Attachments and implements should be carried as to minimize harm if hit by others while deadheading.

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SAFE OPERATING PROCEDURES

Hydra Platform SOP 12A-41

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**Required Personal Protective Equipment (PPE)**
*(Based on job specific hazard review)*

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1. Follow all manufacturers’ guidelines.
2. Supervisors shall verify that drivers are properly licensed and are capable and qualified to operate the equipment before being allowed to operate unsupervised.
3. Operators/drivers shall perform a pre-operational inspection of all equipment, be familiar with operator's manual, report all needed repairs promptly, and avoid using unsafe equipment.
4. Operators/drivers and passengers shall wear seat belts and shoulder harness as provided and as required by North Carolina law.
5. Windshield, windows and mirrors should be kept clean.
6. When mounting or dismounting equipment, maintain three points of contact; do not jump from the equipment.
7. While the vehicle is in travel, no personnel shall be allowed to ride anywhere except the cab of the equipment/vehicle.
8. Get out and look (GOAL) or use a spotter when backing the vehicle. Make sure back-up alarm is functional.
9. Choose a safe location to park equipment; avoid parking near other equipment when possible.
10. Operators should be aware of personnel in the work zone.
11. Before raising tilt tower, check clearances and be aware of overhead utility lines.
12. Always follow manufacturer’s deployment guidelines for tower and platform.
13. Trained operator should remain on bridge deck while platform is in use.
14. Equipment set up on a bridge deck shall be safeguarded by means of a planned traffic control plan. In certain locations where wide loads are anticipated, NCDMV should be notified prior to the start of the work operation; an employee spotter may also be utilized.
15. Avoid pinching or crushing injuries by warning all personnel prior to extending outriggers.
16. During outrigger deployment, an operator shall remain inside the vehicle cab so as to provide braking during set-up.
17. Personnel on the platform while platform is being propelled must stand at the bottom of the tower assembly. **Only two people allowed on the platform at this time.**
18. Operator must verify path of movement is free from any obstacles above or below before propelling the platform.
19. **Platform maximum weight and load capacities must not be exceeded.**
20. Substructure and superstructure platform operators should maintain communications with employees working on platform. Employees shall be warned prior to movement of platform.
21. Maximum slope for operation of the Hydra Platform truck is 5 degrees.
22. Do not operate the Hydra Platform in wind speed or conditions exceeding 28 mph.
23. Ensure platform is free of debris prior to retraction.
24. Annual inspections and 5-year service inspections of Hydra Platform are required as specified by the manufacturer.

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SAFE OPERATING PROCEDURES

ATVs / UTVs

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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1. This SOP applies to all ATV’s and UTV’s used at NCDOT. ATVs and UTVs pose a serious safety hazard if not used properly.

2. **ATV**: An all-terrain vehicle also known as a quad or four-wheeler. It is a vehicle that travels on low-pressure tires, with a seat that is straddled by the operator, along with handlebars for steering control. Braking and acceleration are also controlled on the handlebars. It is designed to handle a wider variety of terrain than most other vehicles.

3. **UTV**: A utility terrain vehicle also known as a side-by-side, a utility-terrain vehicle, or a utility task vehicle. UTVs typically have a side-by-side seating arrangement, seat belts, and roll-over protection. Most have a cargo box at the rear of the vehicle. UTVs generally have a higher payload capacity and are longer and wider than ATVs.


5. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.

6. Supervisors shall verify that operators are trained and qualified on each type of equipment before allowing the equipment to be operated.

7. For all ATVs and UTVs operated on rough terrain, wear all required PPE when operating, including helmet, eye protection (safety glasses or goggles), sturdy safety boots, and gloves.

8. Seat belts must be worn if provided by the manufacturer. Seat belts are provided for most UTVs and some Side-by-Side ATVs.

9. ATVs and UTVs should not be driven on Paved Roads; they are only intended for off-road terrain.

10. Only travel through water no deeper than floor board depth using most direct means to cross.

Related SOP’s

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SAFE OPERATING PROCEDURES

Air Compressor

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<td>Protective clothing</td>
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1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of all air hoses, couplings and connections to determine if leakage or other damage exists. Be familiar with operator’s manual. Do not operate unsafe equipment.
3. Choose safest location to place compressor unit or compressor vehicle within work area. Never run exhaust near a confined space.
4. Use wheel chocks to prevent runaways.
5. Decompress air from compressor prior to removing any caps or air equipment attachments such as jackhammers, drills, etc.
7. Watch for flying sand and other debris when operating compressor. Be aware of wind direction and try to work upwind if possible.
8. Operators should be aware of employees and others on foot in work zones.
9. Make sure hose connections and safety clips are secure to avoid hose coming loose during use. High-pressure air can cause serious injury.
10. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
11. Pressure-relief valve should be checked and the pressure relieved before transporting.
12. At the end of each shift, compressor should be shut down, air receiver condensate drain valve opened and the system allowed to bleed down. Valve should remain open until the system is restarted and air begins to blow off.
13. If compressor is to be used for breathing purposes, the air must be tested to ensure it is at least grade D.
14. A high temperature and/or carbon monoxide alarm must be installed on oil-lubricated compressors.
15. Employees exposed to falling objects shall wear a hardhat. This will be determined by a site specific hazard assessment.

Related SOP’s

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SAFE OPERATING PROCEDURES

Attenuators, Truck Mounted  

Hazard Review

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Required Personal Protective Equipment (PPE)

| Safety Vest | Safety Shoes |

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Hook and unhook on level ground.
3. Keep attenuator wheels blocked when attenuator is not mounted to the truck if so equipped.
4. While operating, be aware of overhang, especially when adjacent to guardrails or fixed objects. Move out gradually.
5. Be aware of excessive overhang while backing.
6. Understand that the attenuator, although it protects our driver and the public, will not lessen vehicle roll-ahead if hit from behind.
7. Keep attenuator in the down position while shadowing; raise before deadheading.
8. All repairs and adjustments should be made away from the travel way.
9. Drive carefully while deadheading.
10. Wear seat belt and shoulder harness when operating truck.

Related SOP’s

- General SOPs ..........................................Chapter 10
- Truck, Crew Cab and Flatbed .........................12A-29
- Truck, Dump .............................................12A-30

Attenuators, Truck Mounted – SOP 12B-2
SAFE OPERATING PROCEDURES

Brush Chipper

Hazard Review

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Required Personal Protective Equipment (PPE)

(Based on job specific hazard review)

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<tr>
<td>Safety Vest</td>
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<td>Safety Glasses</td>
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<tr>
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</table>

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. As applicable, the chipper should be positioned as far from travel lanes as is feasibly possible. Operations visibility can be enhanced through the use of proper traffic warning and control such as signs, cones and barrels. Consult the applicable traffic control guidelines.
3. Work vehicles should be positioned to minimize the risk of injury from intruding traffic.
4. Operators shall perform a pre-operational check of their equipment including checking the location and proper operation of the emergency shut-off switch. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use equipment that is unsafe.
5. If the brush chippers is equipped with a winch, cable and hook, ensure the hook has safety latch in place and winch cable is serviceable and not damaged.
6. Avoid wearing loose clothing such as coats or shirts. The employee feeding the brush chipper may remove the safety vest as long as they are working within a protected work area while operating the brush chipper. Approved ANSI 107 Hi-Vis orange or yellow-green colored clothing such as tee shirts may be substituted for safety vests but all clothing must be snug when working near the chipper.
7. Wear gloves with tight-fitting cuff.
8. Safety glasses shall be worn when using logger helmet face shield.
9. Apply appropriate poison ivy skin protectant and insect repellent.
10. Ensure that all shields covers, guards and access panels are in place and secure prior to starting the engine. No one should reach into the in-feed hopper when the cutter disk or rotary drum or feed rollers are still moving.
11. Ensure that all by-standers are at a safe distance from equipment.
12. Check brush for wire, rope, vines and other hidden hazards before feeding into chipper.
13. Never allow hands to enter the infeed spout. Do not stand behind machine while operating.
14. Turn engine off and remove key before making any adjustments or repairs.
15. Ensure safety chains are hooked before towing.
16. Feed short material into chipper by placing it on top of longer material that is feeding into chipper.
18. Never try to force-feed larger materials into the chipper than it is designed to accept.
19. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
20. Be aware of employees and others in work zone. Only those employees feeding brush should be near chipper.
21. Ensure chipper discharge is turned in a safe direction and that it is secured if removed from the towing vehicle.

| Related SOP’s               |
|-----------------------------|-----------------------------|
| General SOPs                | Chapter 10                  |
| Truck, Dump                | 12A-30                      |
| Truck, Crew Cab and Flatbed | 12A-29                      |
| Trailers and Towed Equipment | 12B-30                      |
SAFE OPERATING PROCEDURES

Chainsaw SOP 12B-4

Hazard Review

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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<td>Hard Hat</td>
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</table>

1. This SOP applies to all chainsaws including lightweight, trimming, or pruning types. Pole Saw/Pruner is covered in separate SOP 12B-34.
2. Follow all manufacturers’ guidelines.
3. Supervisors shall verify that operators are trained and qualified on each type of equipment before allowing the equipment to be operated.
4. Operators shall check controls, chain tension, all bolts, handle, and ensure throttle lock operates properly and chain catcher is in place to ensure they are functioning properly and adjusted according to the manufacturer’s instructions. Report all needed repairs promptly and do not use any equipment that is unsafe.
5. Do not wear loose jewelry or chains. Snug fitting clothing shall be worn, but allow complete freedom of movement.
6. Safety vests shall be worn when working in right of way. Safety vests shall be adjusted to snug fit.
7. Always use the following precautions when handling fuel and refueling the chainsaw:
   • Always store gasoline in an approved container.
   • Do not smoke while handling fuel.
   • Beware of static electricity and sparks between saw and fuel cans (metal and plastic).
   • Always stop the engine to refuel the tank and allow engine to cool.
   • Avoid spilling fuel or oil. Spilled fuel should always be cleaned up.
   • Do not remove fuel tank cap when engine is running.
   • Move the chainsaw at least 10 feet from the fueling point before starting the engine.
   • Keep the handles dry, clean and free from oil or fuel mixtures.
8. Before you start the engine, make sure the chain is not contacting any object and the chain brake is engaged.
9. Start the chainsaw engine on the ground. Do NOT drop start a chain saw.
10. Never start the chainsaw until you are at the location where you intend to use the saw.
11. Do not allow other persons to be near the chainsaw when starting or cutting.
12. Never start cutting until you have a clear work area, secure footing, and an escape route planned.

13. Inspect condition of tree prior to cutting for insect infestation or dead portions which may fall during cutting tree.

14. Safety glasses or goggles shall be worn in conjunction w/ face shield.

15. Wipe off perspiration/sweat carefully to avoid getting sawdust or particles in eyes.

16. When operating chain saw, be aware of the stress of the item being cut. Pinching may result on compression side, and sudden break may result on tension side.

17. Always hold the chainsaw firmly with both hands when the engine is running. Use a firm grip with thumb and fingers encircling the chainsaw handles.

18. Keep all parts of body away from the chain when the engine is running. Engage chain brake when not cutting or moving with the chainsaw engine running.

19. Do not cut with the chainsaw above your head to guard against kickback and to help prevent back injuries. Do not contact material with tip of chain saw.

20. Always shut off the engine before putting down the chainsaw.

21. Operate the chainsaw only in well-ventilated areas.

22. Do not use a chainsaw in a bucket truck or other type of aerial lift unless you have been trained and are qualified to operate the aerial lift being used.

   • All PPE for use of chainsaw must be worn in the bucket truck or other type aerial lift.
   • Fall protection consisting of full body harness and fall arrest or restraint lanyard must be used in bucket truck or other type of aerial lift while using a chainsaw.
   • Chainsaw should be shut-off with brake engaged, and be stored in a scabbard attached to bucket truck or aerial lift or secured with chainsaw lanyard or other restraining device when aerial lift is moving.
   • Ensure area below aerial lift is clear to protect personnel and vehicles from falling debris.
   • Always engage the chain break when not cutting while in the aerial lift.
   • When starting chainsaw in aerial lift, use the leg lock method if sufficient room is available or support the chainsaw on sturdy structural support with the chain break engaged. The chain must not be in direct contact with supporting surface when starting the chainsaw.

23. During emergencies, look for downed utility lines before cutting with chainsaw.

24. Take frequent breaks. If you lack sufficient strength to maintain control of the chainsaw, do not use it.

### Related SOP’s

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12B-13 | 12B-34
SAFE OPERATING PROCEDURES

Compactors, Hand-Operated

Hazard Review

Traffic Noise Trench Collapse
Lifting

Required Personal Protective Equipment (PPE)

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<th>Safety Shoes</th>
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<tr>
<td>Safety Glasses</td>
<td>Gloves</td>
<td>Hearing Protection</td>
</tr>
</tbody>
</table>

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Keep work area clear of tools or obstructions.
4. Operators should be aware of surroundings and have escape route located.
5. Compact material in lifts that are uniform and even.
6. Do not leave tools or materials in areas where vibration from passing compactors could cause them to fall.
7. Use proper procedures for lifting and transporting compactors.
8. Do not leave equipment running while unattended. Shut off engine when not in use.
9. Use proper foot placement and balance when operating equipment.
10. Do not fill fuel tank or remove fuel cap while equipment is running.
11. Do not operate without proper ventilation.
12. Follow Excavation, Trenching and Shoring Standards for work in trenches over four feet in depth.

Related SOP’s

General SOPs ............................................. Chapter 10 Excavating, Trenching and Shoring ................. 11E-3
SAFE OPERATING PROCEDURES

Concrete Mixer

Hazard Review

Noise Flying Objects Concrete Burns

Required Personal Protective Equipment (PPE)

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<td>Hearing protection</td>
<td>Respirator</td>
<td>Gloves</td>
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</table>

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Clean drum and moving parts after each use.
4. Keep hands and feet clear of all moving parts.
5. Ensure that area is cleaned and level enough before operating machine.
6. Proper lifting techniques shall be used. Get help or use equipment if necessary. Use caution when moving machine and when shoveling materials to avoid back injury.
7. Make sure hose connections are secure to avoid hose coming loose during use. High-pressure air can cause serious injury.

Related SOP’s

- General SOPs.................................Chapter 10
- Air Compressor............................12B-1
- Trailers and Towed Equipment..........12B-30
- Truck, Crew Cab and Flatbed ..........12A-29
- Hand Tools (Power and Manual).........12B-13
SAFE OPERATING PROCEDURES

Concrete Pump SOP 12B-7

Hazard Review

| Lifting | High Pressure Hoses | Concrete Burns |

Required Personal Protective Equipment (PPE)

| Safety Vest | Safety Shoes | Safety Glasses/Goggles |
| Gloves | Hearing Protection |

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Insure all connections are correctly attached and tight and leveling screws are in place and tightened.
4. Test start machine and pumping mechanism prior to filling hopper with concrete.
5. After attaching hoses and insuring all clamps and chute locks are closed, use diesel fuel and a slurry mix to lubricate machine and hoses.
6. Never unlock chute when machine is bogged down. Locate blockage (usually a hard lump in hose) and break clot by beating hose with a hammer. Additional water may be needed to pump hose clear.

Related SOP’s

General SOPs..................................................... Chapter 10
SAFE OPERATING PROCEDURES

Concrete Saw

Hazard Review
Cutting Blades
Traffic Noise
Flying Objects

Required Personal Protective Equipment (PPE)
Safety Vest
Hardhat (see item #15)
Safety Shoes
Safety Glasses/Goggles/Face Shield
Gloves
Hearing Protection
Respirator

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Use correct amount of water while operating blade in the cut mode.
4. Check all water hoses for cuts and leaks.
5. Keep all safety guards in place while operating.
6. Check blade nuts for tightness.
7. Do not force or bind blade in slot being sawed.
8. Do not raise protective shield from around blade when operating saw.
9. When installing or changing blade, disconnect spark plug.
10. Operate engine at proper speed. Never alter the rpm or governor setting.
11. Operators should stand away from and to the side of the blade when in use.
12. Use proper procedures for lifting and transporting the equipment. The blade will be disengaged or removed while loading and unloading the equipment.
13. Do not fill fuel tank or remove fuel cap while engine is running.
15. Employees exposed to falling objects shall wear a hardhat as determined by a site specific hazard assessment.

Related SOP’s
General SOPs ........................................ Chapter 10
SAFE OPERATING PROCEDURES

Conveyor

SOP 12B-9

Hazard Review

Transporting Pinching Crushing
Overhead Objects

Required Personal Protective Equipment (PPE)

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<tr>
<td>Safety Glasses</td>
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</table>

1. Supervisors shall verify that operators are capable and qualified on conveyor belt operation before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of the conveyor. Report all repairs immediately. Be familiar with operator’s manual. Do not use any equipment that is unsafe.
3. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer when available.
4. Be aware of crushing and pinching hazard while adjusting conveyor belt. Get help or use machinery when dismantling or erecting same for use.
5. When transporting, obtain proper permit for moving. Have both front and rear shadow vehicles equipped with warning lights when transporting.
6. Vehicles involved in transportation of conveyor should be equipped with radio communication when available.
7. Supervisors shall review route of transporting, insuring of no overhead conflicts.

Related SOP’s

General SOPs ..................................................Chapter 10   Truck, Tractor and Trailer.........................12A-36
SAFE OPERATING PROCEDURES

Curb Machine  SOP 12B-10

Hazard Review

| Traffic | Hot Asphalt |

Required Personal Protective Equipment (PPE)

| Safety Vest | Safety Glasses | Safety Shoes |

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Choose safest location possible to park machine.
4. Clean hopper and moving parts after each use with proper cleaning solvents.
5. Keep hands and feet clear of all moving parts.
7. Ensure that area is cleaned and level enough before operating machine.
8. When feeding machine, do not insert shovel or other tool in hopper.
9. Proper lifting techniques shall be used. Get help or use equipment if necessary. Use caution when pulling machine and when shoveling asphalt to avoid back injury.
10. Do not work in front of machine when it is in operation.
12. Do not fill fuel tank or remove fuel cap when engine is running.

Related SOP’s

General SOPs ...........................................Chapter 10  Truck, Dump ................................................12A-30
SAFE OPERATING PROCEDURES

Fumigation (Gassing) Rig
Attachment to Wheel Tractor

Hazard Review
Hazardous Vapors

Required Personal Protective Equipment (PPE)

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1. Operation of fumigation rig will be supervised by individual who possesses an appropriate N. C. Department of Agriculture Pesticide Applicator License.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Rig must be inspected before each day’s operation. Check for weak, worn, defective parts and leaks.
4. Inspect, service, clean and replace parts as required before beginning seasonal start-up of rig.
5. Inspect, service, clean and replace parts as required at end of seasonal operation (use) of rig.
6. Label and MSDSs of all fumigants to be used with rig will be reviewed by supervisor with all members of fumigation crew prior to being used. Poison Control Center telephone number should be posted on equipment.
7. Follow label directions.

Related SOP’s

| General SOPs ........................................ Chapter 10  Tractor, Wheel ........................................ 12A-25 |
|------------------------------------------------------------|-----------------------------------------------|
| Tractor Attachments ........................................... 12B-29 |

Fumigation (Gassing) Rig – SOP 12B-11
SAFE OPERATING PROCEDURES

Generator

SOP 12B-12

Hazard Review

Inclement Weather  Electrical Shock

Required Personal Protective Equipment (PPE)

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1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Guard against electric shock.
3. Avoid touching live terminals or receptacles.
4. Be extremely careful if operating in inclement weather.
5. Do not make or break electrical receptacle connections under load.
6. Use only grounded receptacles and extension cords. Discard old cords.
7. Generator must be properly grounded.
8. Operators should use caution and remain alert around hot engine parts, moving parts and generator output.
9. Provide safety guards for all drive systems.
10. Keep all safety guards and power shields in position and tightly secured.
11. Do not wear loose clothing, neckties or jewelry that could be caught in moving parts.
12. Provide adequate ventilation when in use.
13. Keep area around generator clean and dry. Remove all material that can create slippery conditions. Remove oily rags and other flammable material from the area.
14. Keep a fire extinguisher near the generator.
15. When transporting, ensure that generator is properly secured.
16. Do not fill fuel tank or remove fuel cap while engine is running.

Related SOP’s

| General SOPs .................................................Chapter 10 | Field Emergency Response ..............................11D-1 |
SAFE OPERATING PROCEDURES

Hand Tools (Power and Manual) SOP 12B-13

Hazard Review

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Required Personal Protective Equipment (PPE)

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<tbody>
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<td>Hearing Protection</td>
<td>Respirator</td>
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</table>

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Never use a tool to do a job it was not designed to do.
3. Use tools in the manner for which they are designed to avoid tool damage and personal injury.
4. Keep work area clean to avoid slipping, tripping or falling.
5. Avoid using power tools or hand tools that are dull.
6. Power saws, chain saws and drills that have dull blades or bits can cause binding or kickback, which can result in cuts, bruises and loss of fingers or limbs.
7. Be aware of safety devices on tools; check regularly and use only tools with all safety devices properly operating.
8. Do not use electric power tools with damaged cords or switches.
9. Place tools in safe position when not in use so that sharp points are not exposed.

Related SOP’s

General SOPs .................................................. Chapter 10
SAFE OPERATING PROCEDURES

Impactor-Asphalt Cutter SOP 12B-14

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<tr>
<td>Safety Vest</td>
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1. Operators shall perform a pre-operational check of equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not operate any equipment that is unsafe. Shut engine off when not in use.
2. Never leave machine unattended with the engine running.
3. Do not leave attachment in the raised position when it is not in use.
4. Locate utilities prior to beginning operation.
5. Never allow anyone to work under raised attachment without proper safeguards in place and secured.
6. Never attempt to start or operate the machine except from the operator’s station.
7. Check bolts, fittings and housing for cracks three (3) times a day.
8. Be sure of position of impactor to surface.
9. Operators should be aware of employees and others in work zone.

Related SOP’s

General SOPs...........................................Chapter 10    Tractor, Backhoe and Loader.........................12A-22
Ladder

SAFE OPERATING PROCEDURES

Hazard Review

Pinching

Slip, Trip and Fall

Required Personal Protective Equipment (PPE)

| Safety Vest | Safety Shoes | Gloves |

1. Inspect for cracks, breaks or weak points. Replace if found defective.
2. Do not use metal or conductive ladders near energized lines or equipment.
3. When climbing, use rungs for handholds rather than side rails.
4. Utilize middle porting of each rung rather than edges when climbing.
5. Do not climb above manufacturer’s recommended height as marked on the ladder.
6. Do not exceed manufacturer’s weight capacity for the ladder.
7. Locate base of ladder on firm, level and solid footing. Secure as necessary to provide stability.
8. Use the correct sized ladder for the job. Do not over reach.

Related SOP’s

General SOPs........................................ Chapter 10
SAFE OPERATING PROCEDURES

Line Remover, Traffic Paint  
SOP 12B-16

**Hazard Review**

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<th>Description</th>
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<tbody>
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</tr>
<tr>
<td>Pinching</td>
<td>Crushing Traffic</td>
</tr>
</tbody>
</table>

**Required Personal Protective Equipment (PPE)**

<table>
<thead>
<tr>
<th>PPE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Vest</td>
<td>Safety Shoes</td>
</tr>
<tr>
<td>Hearing Protection</td>
<td>Safety Glasses/Goggles</td>
</tr>
<tr>
<td></td>
<td>Gloves</td>
</tr>
</tbody>
</table>

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Use tools in the manner for which they are designed.
4. Keep hands and feet clear of cutter blades when machine is in operation.
5. Operators should make sure rubber safety shield is in place before operating equipment.
6. Do not fill fuel tank or remove fuel cap while engine is running.
7. Do not work in front of machine when it is in operation, unless the machine is designed for both front and rear operation.

**Related SOP’s**

General SOPs............................................... Chapter 10
**SAFE OPERATING PROCEDURES**

**Mulch Blower**

**Hazard Review**

<table>
<thead>
<tr>
<th>Backing</th>
<th>Mounting/Dismounting</th>
<th>Flying Objects</th>
</tr>
</thead>
</table>

**Required Personal Protective Equipment (PPE)**

<table>
<thead>
<tr>
<th>Safety Vest</th>
<th>Safety Shoes</th>
<th>Safety Glasses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard Hat (see item #13)</td>
<td>Hearing Protection</td>
<td>Gloves</td>
</tr>
<tr>
<td>Respirator</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Supervisors shall verify that all operators are capable and qualified to operate the mulch blower.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Make sure area to be mulched is clear of people, other equipment and vehicles.
4. Operators are to be aware that there will be flying debris. Watch for passing motorists.
5. Keep height of blower chute properly adjusted.
6. Keep chain drive and motor rpm’s adjusted only to amount needed for proper mulching application.
7. Ensure safety chains are hooked before towing.
8. Ensure engine is off and key removed before cleaning, adjusting or repairing separator or blower.
9. Be careful of footing and do not wear loose clothing when feeding mulch spreader.
10. Never attempt to start or operate the machine except from the operator’s station.
11. Operators should make a visual inspection of work area prior to beginning work.
12. Watch for flying debris during mulching operations. Be aware of wind direction and try to work upwind. Restrict usage during high winds.
13. Employees exposed to falling objects shall wear a hardhat as determined by a site specific hazard assessment.

**Related SOP’s**

- General SOPs.................................Chapter 10
- Trucks, Crew Cab and Flatbed.......................12A-29
- Trailers and Towed Equipment.....................12B-30

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Mulch Blower – SOP 12B-17
SAFE OPERATING PROCEDURES

Pavement Breaker / Jack Hammer SOP 12B-18

<table>
<thead>
<tr>
<th>Hazard Review</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise</td>
<td>Lifting</td>
<td>Flying Objects</td>
</tr>
<tr>
<td>Dust</td>
<td>Respirable Crystalline Silica (RCS)</td>
<td></td>
</tr>
</tbody>
</table>

**Required Personal Protective Equipment (PPE) (Based on job specific hazard review)**

<table>
<thead>
<tr>
<th>Safety Vest</th>
<th>Safety Glasses</th>
<th>Safety Shoes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearing Protection</td>
<td>Particulate respirator if RCS above PEL</td>
<td></td>
</tr>
</tbody>
</table>

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Check all air hoses, couplings, connectors and pavement breaker or jack hammer for leaks or damage. Be familiar with operator’s manual.
4. When loading or unloading pavement breaker or jack hammer, use proper lifting procedures.
5. Verify location of underground utilities before beginning work.
6. Operators should be aware of employees and others on foot in work zones.
7. Watch for flying debris from operation of pavement breaker or jack hammer. Be aware of wind direction and try to work upwind if possible.
8. Operators should make a visual inspection of work area prior to beginning work.
9. The use of applied water for dust suppression should be used. If not available, use particulate respirator of assigned protection factor (APF) 10 or better based on risk assessment.
10. This task is included in NCDOT Silica Exposure Control Plan.

**Related SOP’s**

| General SOP’s .....................................Chapter 10 | High Pressure Hoses ....................................11E-6 |
| Broom ....................................................12A-3 | Air Compressor .........................................12B-1 |
| Hand Tools (Power and Manual) ..............................12B-13 | |

Pavement Breaker/Jack Hammer – SOP 12B-18
SAFE OPERATING PROCEDURES

Pile Driving Analyzer

Hazard Review

<table>
<thead>
<tr>
<th>Noise</th>
<th>Poisonous Plants, Snakes and Insects</th>
<th>Crane Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moving Equipment</td>
<td>Heights</td>
<td>Falling Objects</td>
</tr>
<tr>
<td>Slip, Trip and Fall</td>
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<td></td>
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</tbody>
</table>

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Vest</th>
<th>Safety Glasses/Goggles</th>
<th>Safety Shoes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearing Protection</td>
<td>Hard Hat</td>
<td>Body Harness/Lanyard</td>
</tr>
</tbody>
</table>

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Be aware of poisonous plants, snakes and insects. Wear long sleeve shirts, gloves and high top boots when hazards cannot be avoided.
3. Do not stand near operating hammer as a variety of parts of potentially large size may fall and could cause serious injury.
4. Be extremely careful when the piles or the leads are lifted by the crane. Always watch during this process and plan an escape route in case of crane failure.
5. When working near the hammer, make sure the hammer weight is not in a lifted position. Never place your arm or head between the pile top and a lifted hammer.
6. If it becomes necessary to climb the leads, be sure the contractor and crane operator are aware that this is being done. The hammer should not be started while DOT employees are on the leads.
7. Be careful of moving construction equipment and stay clear of the crane when it is rotating.
8. Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions.
9. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

Related SOP’s

General SOPs ..............................................Chapter 10  Pile Driving .......................................................... 11B-57
Generators ................................................. 12B-12  Hand Tools (Power and Manual) ................... 12B-13
SAFE OPERATING PROCEDURES

Post Puller

Hazard Review

<table>
<thead>
<tr>
<th>Traffic</th>
<th>Crushing</th>
<th>Pinching</th>
</tr>
</thead>
</table>

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Vest</th>
<th>Safety Shoes</th>
<th>Hard Hat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Glasses</td>
<td>Gloves</td>
<td></td>
</tr>
</tbody>
</table>

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment and be familiar with the operator’s manual.
3. Do not use any equipment that is unsafe. Report needed repairs promptly.
4. Ensure detachable puller is in good working order and is correctly attached.
5. When transporting, ensure that post puller is properly secured.

Related SOP’s

General SOPs ...............................Chapter 10  High Pressure Hoses ..............................11E-6
Power Washer

SOP 12B-21

### Hazard Review

<table>
<thead>
<tr>
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<th>Flying Objects</th>
<th>Traffic</th>
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</thead>
<tbody>
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<td>Cleaning Solution</td>
<td>Hot Water</td>
</tr>
<tr>
<td>Noise</td>
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</tbody>
</table>

### Required Personal Protective Equipment (PPE)
(Based on job specific hazard review at job site)

<table>
<thead>
<tr>
<th>Safety Vest</th>
<th>Safety Shoes</th>
<th>Safety Goggles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
<td>Face Shield</td>
<td>Hard Hat</td>
</tr>
<tr>
<td>Hearing Protection</td>
<td></td>
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</tr>
</tbody>
</table>

1. Follow all manufacturers’ guidelines.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe. Insure all connections are correctly attached and tight.
4. When using an intake hose, make sure hose is not drawing mud, sand or other bottom material into the pump system.
5. When using any of the tips for the powerhead/wand assembly, be extremely careful not to direct flow towards air hoses, safety lines, equipment or other personnel. Remember that these tips force water at a velocity high enough to cut through concrete.
6. Be aware of slippery conditions.
7. Never leave equipment unattended with the engine running. Shut engine off when not in use.
8. Operator should make a visual inspection of work area prior to beginning work.
9. Always inspect the powerhead/wand to make sure the tip is properly secured. If the tip comes loose, it may become a flying projectile.
10. If at any time the unit is not operating properly, use the lock out tag out procedure until the unit is repaired.

### Related SOP’s

<table>
<thead>
<tr>
<th>General SOPs</th>
<th>Chapter 10</th>
<th>High Pressure Hoses</th>
<th>11E-6</th>
</tr>
</thead>
</table>
SAFE OPERATING PROCEDURES

Rock Drill-Hydraulic, Crawler

Hazard Review

Utility Lines Backing
Steep Terrain Flying Objects
Noise Mounting/Dismounting Rock Dust

Required Personal Protective Equipment (PPE)

Safety Vest Safety Shoes Hard Hat
Safety Glasses/Goggles Respirator Hearing Protection

1. Supervisors shall verify that operator is capable and qualified on equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not operate equipment that is unsafe.
3. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from vehicle.
4. Always check to the rear before backing and use an observer whenever available.
5. Be aware of overhead and underground utility lines when operating equipment.
6. Operators shall make a visual inspection of work area prior to beginning work.
7. Stay off slopes too steep for safe operation.
8. Personal Flotation Devices and safety harnesses may be required.
9. Never attempt to start or operate the machine except from the operator’s station.
10. Operators should be aware of employees and others on foot in work zones.
11. Never leave equipment unattended with the engine running. Shut engine off when not in use.
12. Choose safest location possible to park equipment. Avoid parking in other equipment’s blind spot.

Related SOP’s

- General SOPs .................................................. Chapter 10
- Explosives ....................................................... 11E-4
- Truck, Tractor and Trailer .............................. 12A-36
Scaffold SOP 12B-23

**Hazard Review**

- Slip, Trip and Fall
- Falling Objects
- Extreme Heights
- Noise

**Required Personal Protective Equipment (PPE)**

- Safety Shoes
- Hard Hat
- Safety Glasses
- Gloves
- Personal Flotation Device
- Body Harness/Lanyard

1. Check condition of staging, hangers and railing before use.
2. The combined load of workers, materials and tools shall not exceed manufacturer’s rated capacity.
3. Scaffolding shall not be used without proper handrails and toeboards as specified by OSHA.
4. Keep loose tools and materials clear of walkway.
5. Do not work or walk under a scaffold that is being used.
6. Do not overextend to reach something. Move scaffold to the work area.
7. Do not sit or climb on handrails to gain height.
8. Establish safe means of entry/exit onto/from scaffold.
9. Personal Flotation Devices and safety harnesses may be required.
10. Employees should be aware that proper foot placement and balance is important for safe operation.
11. Scaffolds shall not be supported solely by cable, chain or rope systems. Use only roller beam clamps or scissor units.
12. If employees are working 6 feet or more above a lower level, fall protection must be provided by a guardrail system, a work positioning system and/or a fall arrest system comprised of a body harness, lanyard and life line.

**Related SOP’s**

- General SOPs
- Chapter 10
- Hand Tools (Power and Manual)
- 12B-13
SAFE OPERATING PROCEDURES

Snow Plow - SOP 12B-24

Hazard Review

Stationary Objects  Lifting  Traffic
Pinching/Crushing  Inclement Weather  Hooking/Unhooking

Required Personal Protective Equipment (PPE)

Safety Vest  Safety Shoes  Gloves
Safety Glasses/Goggles

1. Operators shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.

2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.

3. Inspect plows and components prior to use as follows and repair or replace any items found to be deficient:
   a. Check plow, plow frame and shear flange for cracks, broken welds or loose bolts.
   b. Check shear flange and pins for proper bolt grade, size, tightness and condition.
   c. Check safety chains and blade for wear and condition.
   d. Check for leaky or damaged hydraulic lines, fittings or cylinders.
   e. Check lube points and lube as needed.
   f. Check all controls to ensure smooth and correct operation.

4. Be aware of pinch points when installing or removing plows. Keep your hands away. Do not lift with your back. Get help and use lifting equipment as needed.

5. Always use safety chains or protective blocking when changing blades or performing other work on plows; never trust the hydraulic system!

6. Adjust your plowing speed to the conditions, i.e. traffic volumes, pedestrians, highway conditions, material to be plowed, terrain and visibility.

7. While plowing, watch for bridge joints, water meters, manholes, railroad tracks, etc.

8. Check the condition of the plow periodically during use using the guidelines provided in number 3a, 3c and 3d above.

9. The use of flags on ends of plow is recommended for visual contact by driver.

10. When possible, plow operators should inspect plowing route and note or mark hazards.

11. For long distance travel (outside normal work area), the snow plow should be chained in the up position to relieve stress on the cylinder and lifting mechanism.

Related SOP’s

General SOPs...............................Chapter 10  Truck, Crew Cab and Flatbed..........................12A-29
Truck, Dump...............................12A-30  Spreader, In-body Salt.................................12B-26
Spreader, Material Tow Type..........12B-27  Spreader, Tailgate.................................12B-28
**SAFE OPERATING PROCEDURES**

**Soil Conditioner, Rotary**

**SOP 12B-25**

**Hazard Review**

<table>
<thead>
<tr>
<th>Backing</th>
<th>Flying Objects</th>
<th>Mounting/Dismounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise</td>
<td>Utilities</td>
<td></td>
</tr>
</tbody>
</table>

**Required Personal Protective Equipment (PPE)**

<table>
<thead>
<tr>
<th>Safety Shoes</th>
<th>Safety Glasses</th>
<th>Hearing Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Vest</td>
<td>Gloves</td>
<td></td>
</tr>
</tbody>
</table>

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Check area to be tilled, removing any foreign objects.
4. Check area for underground water lines, electric cables or pipes.
5. Keep all guards and safety covers in place at all times.
6. Always shut off power source before cleaning tines or making adjustments.
7. Operator should be aware of employees and others on foot in work zones.
8. Stay off hills and slopes too steep for safe operation.

**Related SOP’s**

General SOPs ..........................................Chapter 10  Tractor, Wheel ..............................................12A-25
Tractor Attachments ....................................... 12B-29
SAFE OPERATING PROCEDURES

Spreader, In-Body Salt  

Hazard Review

- Inclement Weather
- Flying Objects
- Mounting/Dismounting
- Overloading
- Traffic

Required Personal Protective Equipment (PPE)

- Safety Glasses
- Safety Vest
- Safety Shoes
- Gloves

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
3. Make sure lighting is working properly on truck and spreader.
4. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
5. Keep hands and body away from all moving parts and be aware of pinch points.
6. Never make any repairs or adjustments on the unit while it is in operation.
7. All personnel must keep clear of spread area.
8. Disengage PTO and depressurize all lines before disconnecting.
9. Make sure spreader is properly secured to truck prior to beginning operation.
10. Do not exceed weight limitations.
11. Obtain assistance when installing and removing spreader from truck as needed.
12. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
13. Spreader shall be calibrated consistent with pre-determined application rate.
14. Spreader is to be cleaned and lubricated following each use.
15. A safety vest shall be worn when the employee is out of the vehicle and exposed to moving or backing vehicles.

Related SOP’s

- General SOPs ..............................................Chapter 10
- Loader, Front End ............................................12A-11
- Truck, Dump ..................................................12A-30
- Snow Plow ....................................................12B-24
SAFE OPERATING PROCEDURES

Spreader, Material-Tow Type

Hazard Review

<table>
<thead>
<tr>
<th>Backing</th>
<th>Traffic</th>
<th>Inclement Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hooking/Unhooking</td>
<td></td>
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</table>

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Vest</th>
<th>Safety Shoes</th>
<th>Safety Glasses</th>
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<tbody>
<tr>
<td>Gloves</td>
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</table>

1. Supervisors shall verify that drivers are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe. Make sure lighting is working properly on truck and spreader.
3. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and employee must use an observer when available. Make sure back-up alarms are working properly.
4. Insure that pintle hook latch is engaged when spreader is attached to truck and safety chains hooked.
5. When parked, spreader shall be secured by wheel chocks to prevent rolling.
6. Spreader shall be calibrated consistent with pre-determined application rate.
7. Do not exceed weight limitations.
8. Keep hands and body away from all moving parts and be aware of pinch points.
9. A reflective vest shall be worn when the employee is out of the vehicle.

Related SOP’s

<table>
<thead>
<tr>
<th>General SOPs</th>
<th>Chapter 10</th>
<th>Loader, Front End</th>
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<tbody>
<tr>
<td>Truck, Dump</td>
<td>12A-30</td>
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</tbody>
</table>
SAFE OPERATING PROCEDURES

Spreader, Tailgate  

Hazard Review

<table>
<thead>
<tr>
<th>Backing</th>
<th>Traffic</th>
<th>Pinching/Crushing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hooking/Unhooking</td>
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</table>

Required Personal Protective Equipment (PPE)

<table>
<thead>
<tr>
<th>Safety Vest</th>
<th>Safety Shoes</th>
<th>Safety Glasses</th>
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<tbody>
<tr>
<td>Gloves</td>
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</table>

1. Supervisors shall verify that drivers are capable and qualified on equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe. Make sure lights are working properly on truck and spreader.
3. Plan ahead to minimize or eliminate the need for backing. Always check to the rear before backing and use an observer if available. Make sure back-up alarms are working properly.
4. Be aware of crushing or pinching hazards when installing, adjusting or removing spreader. Get help or use machinery if necessary.
5. Make sure spreader is securely attached prior to beginning operation.
6. Spreader shall be calibrated to be consistent with pre-determined application rates.
7. Spreader is to be cleaned and lubricated after each use.
8. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
9. Disengage PTO and depressurize all lines before disconnecting.
10. All personnel must keep clear of spread area.
11. Eye protection is required when calibrating spreader. A safety vest shall be worn when out of the vehicle.

Related SOP’s

<table>
<thead>
<tr>
<th>General SOPs</th>
<th>Chapter 10</th>
<th>Loader, Front End</th>
<th>12A-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck, Dump</td>
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SAFE OPERATING PROCEDURES

Tractor Attachments SOP 12B-29

Hazard Review

<table>
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<tbody>
<tr>
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Required Personal Protective Equipment (PPE)

<table>
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<th>Safety Vest</th>
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<tr>
<td>Gloves</td>
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</table>

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
4. Never stand between tractor and attachment during hooking or unhooking operation.
5. Use proper tools, pins, P.T.O., shafts, etc., for hook-ups.
6. Make sure all shields, covers and guards are in proper place and secure.
7. Be aware of crushing or pinching hazards when hooking-up, using, adjusting or removing the attachment.
8. Do not wear loose clothing.
9. Stay clear of all moving parts; shafts, belts, drills flywheels, fans, etc.
11. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
12. Check frame for cracks and loose bolts.

Related SOP’s

General SOPs ..............................................Chapter 10 Tractor, Wheel ..............................................12A-25
SAFE OPERATING PROCEDURES

Trailers and Towed Equipment  

Hazard Review

- Backing
- Unsecured Loads
- Hooking/Unhooking
- Debris on Bed

Required Personal Protective Equipment (PPE)

- Safety Vest
- Safety Shoes
- Gloves

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Operators shall perform a visual and manual check of the “pintle hooks” to ensure that they are secure before the truck and attachment are put to use.
4. Make sure cargo is properly loaded and secured using only approved chain and load binders. Safety chains are to be used on any attachment in tow. Ensure that the chains are of the proper strength for the load and are properly secured to both the vehicle and attachment to be towed.
5. Be aware of height and width of load.
6. Never load a trailer beyond its recommended capacity.
7. Do not allow anyone between truck and trailer when backing to hook trailer.
8. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
9. Make sure trailer-bed and ramps are clear of any debris.
10. Make sure tilt-beds or ramps are secure before putting trailer in use.
11. Hook, unhook, load and unload on stable ground with trailer secure.
12. Be sure taillights and turn signals are in view when towing any attachment that does not have taillight hookup.
13. Observe towing speed limit if applicable.
14. Operators shall be responsible for securing permits for all oversize loads.

Related SOP’s

- General SOPs .................................................Chapter 10
- Truck, Dump ..................................................12A-30
- Truck, Tractor and Trailer ..............................12A-36
- Trucks, Crew Cab and Flatbed ..........................12A-29
- Truck, Geotechnical and Trailer .......................12A-33
SAFE OPERATING PROCEDURES

Trenching Machine 

Hazard Review
Underground Utilities Pinching/Crushing

Required Personal Protective Equipment (PPE)

| Safety Vest | Hard Hat | Safety Shoes |
| Safety Glasses | Gloves |

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
2. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
3. Have all persons stand clear when machine is started and operating.
4. Operators should make a visual inspection of work area prior to beginning work. Clear area to be trenched.
5. Locate and mark any underground utilities or water lines before trenching.
6. Do not work in front of machine when it is in operation.
7. Secure machine properly before transporting.
8. Unload machine at a location protected from traffic exposure.
9. Obtain assistance when necessary to physically handle machine.
10. Do not wear loose clothing and keep shirttails in when operating.
11. Do not work on chain while machine is running.
12. Do not fill fuel tank or remove fuel cap while the engine is running.
13. Stay clear of all moving parts, cables, shafts, belts, flywheels, etc.
14. Never leave equipment unattended with the engine running. Shut engine off when not in use.
15. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.

Related SOP’s
General SOPs .................................................Chapter 10 Trailers and Towed Equipment .................... 12B-30
SAFE OPERATING PROCEDURES

Underwater Air Lift

Hazard Review

Suction Lifting

Required Personal Protective Equipment (PPE)

| Dry or wet suit | Hard Hat | Surface Air Supply | Breathing Apparatus | Gloves |

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. Insure all connections are correctly attached and tight.
3. Secure air supply hoses to upper portion of lift.
4. Secure line at outlet to direct discharge away from personnel and equipment.
5. Keep hands and air lines clear of intake.

Related SOP’s

- General SOPs .............................................Chapter 10
- High Pressure Hoses .................................11E-6
SAFE OPERATING PROCEDURES

Water Pump SOP 12B-33

Hazard Review

Pressurized Water    Lifting    Slip, Trip and Fall

Required Personal Protective Equipment (PPE)

Gloves    Safety Glasses    Safety Shoes    Hard Hat

1. Operators shall perform a pre-operational check of their equipment. Be familiar with the operator’s manual. Report needed repairs promptly. Do not use any equipment that is unsafe.
2. High-pressure hoses should not be kinked. Check hose fittings for proper connections.
3. Operator should never leave machine while pumping is in process.
4. Only nozzle operator will direct the pump operator when to start pump.
5. Make sure all hoses and nozzles are in good shape.
6. Do not stand over hoses.
7. Watch for slipping/tripping hazards in the work area.
8. Use proper lifting procedures for moving hose and placing bagged material.
9. Clean machine properly and thoroughly at end of shift.
10. Do not fill fuel tank or remove fuel cap while engine is running.

Related SOP’s

General SOPs .............................................. Chapter 10
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SAFE OPERATING PROCEDURES

Pole Saw/Pruner

Hazard Review

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Required Personal Protective Equipment (PPE)

*(Based on job specific hazard review)*

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<tr>
<th>Gloves</th>
<th>Safety Shoes</th>
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<td>Hearing Protection</td>
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</table>

1. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.

2. Operators shall perform a pre-operational check of equipment. Be familiar with operator’s manual. Report all needed repairs promptly and do not use any equipment that is unsafe.

3. Operate in a well-ventilated area.

4. Clothing must be snug-fitting, but allow complete freedom of movement. Avoid loose-fitting clothing such as safety vests, jackets, scarves, jewelry, flared or cuffed pants or anything that could become entangled in pruner. Orange or yellow-green colored clothing such as bright orange or yellow-green tee shirts shall be substituted for safety vests.

5. Take frequent breaks. If you lack sufficient strength to maintain control, do not use it.

6. Always stop engine before putting a pole pruner down or carrying it. Accidental acceleration can cause chain to rotate and can be extremely dangerous while carrying it.

7. The muffler and other parts of the engine become hot during operation and remain hot after stopping the engine; this can cause a fire if placed upon combustible debris (leaves, etc.).

8. The chain guard must be used when walking with or transporting the pruner.

9. Fuel in a well-ventilated area. Shut off engine and allow it to cool. Remove fuel cap carefully so as to allow any pressure build-up in the tank to slowly release. Select bare ground and move at least 10’ from fueling spot before starting engine. Wipe off any excess fuel prior to starting.

10. Do not allow other persons to be near the saw when starting or cutting. Keep bystanders at least 50’ (feet) away from the work area, and the tree to be cut, to ensure that dead limbs or trees will not fall on you, others and equipment. Maintain a clear escape route 450 in a safe direction away from the cut. DO NOT STAND DIRECTLY UNDERNEATH THE LIMB BEING CUT!
11. Pruner is not insulated against shock. Do not use near electric lines. Maintain at least 50’ clearance between pruner and any electrical line.

12. Keep pruner on firm ground or other solid surface when starting.

13. Do not cut any material other than wood or wooden objects. Objects such as rocks, fences, nails, etc. can be flung off and injure the operator or bystanders.

14. Keep work area clean and clear of any debris such as fallen limbs or other obstacles that could cause tripping and stumbling hazards.

15. Do not cut vertically from your body. Hold the pole pruner at an angle of not more than 60° from the horizontal level.

16. If bar becomes pinched and caught in the branch so that the chain can no longer move, shut off the pruner and carefully move the branch to open the pinch and release the bar.

17. Prune large diameter branches in several controllable pieces. During emergency operations, look for downed utility lines before using cutting with pruner.

18. Always maintain solid footing. Be extremely cautious when working on slopes or uneven ground. *Never work from the bed of a truck. Never work from a ladder, tree or any other insecure object.* When working at a height above 15’ use a lift bucket. For pruners with adjustable shafts, expand the shaft only as far as intended for the application.

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SAFE OPERATING PROCEDURES

STORM DRAIN CLEANING WITH TRAILER JET SOP 12B-35

Hazard Review

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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1. Follow all manufacturers’ guidelines.
2. Supervisors shall verify that operators are capable and qualified on the equipment before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment and become familiar with the Operator’s Manual. During pre-operational check, ensure nozzle jets are clear and open. Report any needed repairs promptly. Do not use any equipment that is unsafe. **All warning labels located on the equipment must be read and understood and all safety procedures observed.**
4. Keep all doors, shields, and belt guards in place and closed while operating machine.
5. Operator should never leave machine unattended while jetting operation is being performed. Do not stand over hoses.
6. Remove or repair kinked, crushed, bulging, or blistered hoses. Hose fittings should be properly connected. Never exceed maximum working pressure or temperature of hoses.
7. Watch for slipping/tripping hazards in the work area.
8. Implement appropriate traffic control as needed for each work location.
9. Operators should be aware of employees and others on foot in the work area.
10. Plan ahead to minimize the need for backing. Always check to the rear, get out and look (GOAL) or use a spotter.
11. Completely shut down machine when changing nozzles.
12. Make sure employees have been trained in First Aid. Before beginning work, ensure hospital locations are known. If the work area is in a remote location, be certain that there is a plan to address injuries. **When working with water jet spray, even a small amount of high pressure water breaking the skin can cause great bodily harm.**
13. Do not place hands or any body part in front of the jet spray nozzle. Severe injury or amputation may occur.
14. Do not alter equipment beyond manufacturer recommendations.
15. Never enter a confined space until air monitoring/testing has been conducted.
16. Crew members should maintain communication throughout the operation. Utilize hand signal or radios if feasible.
17. Follow the operator’s manual for equipment shut down and storage.
18. When storing hose do not over-tighten hose reel.
19. When using wash down gun:
   - **Do not aim the gun at any person or any part of the body and do not place hand or any part of the body in front of the spray nozzle of tip.**
   - Do not exceed maximum operating pressure of the lowest rated accessory item within the wash down gun system.
   - Do not leave equipment under pressure unattended at any time.
   - Do not use damaged, perforated, bulging, or weakened hoses.
   - Do not use a spray gun with a faulty or damaged trigger lock.
   - Do not operate spray gun if leaking from packing, fitting, hoses, etc. **High pressure fluids can penetrate skin, cloth, etc. and cause serious injury.**
   - Do not operate spray gun if spray nozzle or tip has been removed.
   - Use a two-handed control of spray gun at all times and adopt a secure body stance.
   - Make all persons in work area aware of safety precautions.
   - Shut off power when not in use or when removing gun nozzle.
   - During operation, periodically shut off power and check and tighten threaded connections.

### Related SOP’s

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Salt Brine Tank Applicator SOP 12B-36

Hazard Review

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Required Personal Protective Equipment (PPE)
(Based on job specific hazard review)

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<tr>
<td>Gloves</td>
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</table>

1. Follow all manufacturers’ guidelines.
2. Supervisors shall verify that operators are capable and qualified on each type of equipment before allowing the equipment to be operated unsupervised.
3. Operators shall perform a pre-operational check of their equipment. Be familiar with operator’s manual. Report all needed repairs promptly. Do not use any equipment that is unsafe.
4. Make sure lighting is working properly on truck and salt brine tank applicator.
5. When mounting or dismounting equipment, use steps and handholds provided. Do not jump from the vehicle.
6. Keep hands and body away from all moving parts and be aware of pinch points.
7. Never make any repairs or adjustments on the unit while it is in operation.
8. All personnel must keep clear of spray applicator area.
9. Disengage PTO and depressurize all lines before disconnecting.
10. Make sure salt brine tank is properly secured to truck prior to beginning operation.
11. Do not exceed weight limitations.
12. Obtain assistance when installing and removing salt brine tank from truck as needed.
13. Plan ahead to minimize the need for backing. Always check to the rear before backing and use an observer when available. Make sure back-up alarms are working properly.
14. Salt brine tank applicator shall be calibrated consistent with pre-determined application rate.
15. Use appropriate signage on back of truck or shadow vehicle for brine spraying application.
16. Keep windows and mirrors clean from brine mist to ensure good visibility.
17. Brine sprayer tank is to be emptied of all brine solution prior to removal of tank in order not to exceed weight capacity of support legs following each use.
18. A safety vest shall be worn when the employee is out of the vehicle and exposed to moving or backing vehicles.
19. Bulk loading stations must have within 25 feet of a temporary eye wash station and trucks must have first aid kit with single use eye wash applicator.

Related SOP’s

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SAFE OPERATING PROCEDURES

String Trimmer / Brush Cutter

Hazard Review

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Required Personal Protective Equipment (PPE)

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1. Follow all manufacturers’ guidelines. Review instruction manual for safe operation.
2. Review Safe Operating Procedures for applicable equipment and perform pre-operational checks.
3. This SOP applies to all string trimmers and brush cutters including models equipped alternately with string heads and brush blades.
4. Supervisors shall verify that operators are trained and qualified on each type of equipment before allowing the equipment to be operated.
5. Wear all required PPE when operating, including both safety glasses AND face shields or screens. Wear gloves and hearing protection in starting and operating trimmer.
6. Always use safe procedures for fueling trimmers. Do not smoke while handling fuel. Always stop engine before fueling and allow engine to cool. Always store fuel in approved container.
7. Always start engine on the ground. Do not drop start trimmer.
8. Inspect work area before trimming for hidden objects or other hazards.
9. Take breaks to allow hands to maintain feeling and circulation to avoid repetitive motion and vibration effects.
10. Drink enough water or sports drinks to stay ahead of dehydration.
11. Make sure co-workers or bystanders maintain a safe distance from trimming.
12. Gearbox becomes hot during operation. Allow gearbox to cool before adding string or changing blades.
13. Do not overreach. Keep proper footing and balance. Move your feet, limit twisting at the waist and bending. Special care with footing must be taken on slopes, in slippery or wet conditions, and in high vegetation which may conceal tripping hazards.
14. Use the appropriate deflector for the string head or blade being used. Keep deflector adjusted properly according to the manufacturer’s instruction manual.

Related SOP’s

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