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SAFETY POLICY & PROCEDURE

Personal Protective Equipment

SPP#1910.132

Quick Reference

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1.0 Purpose

The purpose of this safety policy and procedure is to eliminate or minimize North Carolina Department Transportation (NCDOT) employee exposure to work hazards for common tasks performed where Personal Protective Equipment may be required.

2.0 Scope and Applicability

The use of Personal Protective Equipment (PPE) to eliminate or minimize injuries is an important component of NCDOT's safety program. PPE includes all protective clothing and accessories designed to create a barrier against workplace hazards. PPE should be considered a means of preventing injuries by controlling hazards only after engineering controls, administrative controls, and safe work practices have been implemented.

This safety policy and procedure establishes the methods and accountability for implementing the NCDOT Personal Protective Equipment (PPE) Program. It provides guidelines for selecting PPE based on the hazard. It includes provisions for training and discussion on the need for hazard assessments. It also presents PPE requirements for the head, eye and face, ear, hand, foot and leg, body, and respiratory system. Additionally, this safety policy and procedure addresses fall protection requirements and the use and maintenance of PPE.

This document details the areas of responsibility for managers/unit heads, supervisors, employees, Safety and Risk Management, and Central Inventory Equipment Unit within NCDOT.

This safety policy and procedure affects any employee who is exposed to hazards that require PPE.

3.0 Reference

This safety policy and procedure is established in accordance with Occupational Safety and Health Standards for General Industry (29 CFR 1910.132-140) and Occupational Safety and Health Standards for Construction Industry (29 CFR 1926.95-107).

4.0 Policy

It is the policy of NCDOT to provide a place of employment free from recognized hazards that cause or are likely to cause death or serious physical harm to employees or the public. PPE shall be specified, appropriate to the hazard, only after engineering practices, administrative practices, and safe work practices have been implemented to control the hazard(s). Proper training regarding PPE will also be implemented. These measures will be implemented to minimize those hazards to ensure the safety of employees and the public.

5.0 General Responsibilities

It is the responsibility of each manager/unit head, supervisor, and employee to ensure implementation of NCDOT's safety policy and procedure on PPE. It is also the responsibility of each NCDOT employee to immediately report any unsafe act or condition to their supervisor. Specific responsibilities are found in Section 6.3.

6.0 Procedure

This section provides applicable definitions, establishes general provisions, and identifies responsibilities required by NCDOT's safety policy and procedure on PPE.

6.1 Definitions

ANSI

American National Standards Institute

PPE

Personal Protective Equipment

6.2 General Provisions

This section details the provisions of this safety policy and procedure with each provision discussed in a separate subsection. These provisions are:

1. Training
2. Hazard Assessment
3. Head Protection
4. Eye and Face Protection
5. Hearing Protection
6. Hand Protection
7. Foot and Leg Protection
8. Body Protection
9. Respiratory Protection
10. Fall Protection
11. Use and Maintenance

6.2.1 Employee Training

Training shall be provided in the use of PPE covering:

1. When PPE is necessary based on hazard assessment.
2. What type of PPE is necessary for a specific job task.
3. How to don, remove, adjust, and wear PPE.
4. Limitations of PPE.
5. Proper care, maintenance, useful life, and disposal of PPE.

All employees shall be trained before use of the specific PPE to minimize exposure to hazards for work-related tasks. Supervisors shall ensure that their employees wear the proper PPE based on hazard assessments for specific work tasks as outlined in Safe Operating Procedures (SOP) or hazard assessment at job sites utilizing Operational Risk Management (ORM) which are not addressed in a specific SOP.

6.2.2 Hazard Assessment

Wherever possible, engineering, and administrative controls should be used first to eliminate or reduce employees' exposure to any workplace hazard. Hazard assessments have been conducted to identify all hazards that would necessitate PPE for common DOT work tasks and equipment used and are documented in DOT Safe Operating Procedures (SOP). The Hazard Review section of each SOP identify the hazards and the Required PPE section lists all PPE required.

At each work site a hazard assessment will determine what additional PPE may be required for hazards identified if a specific SOP does not address the task or other hazard that may be present. 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.

6.2.3 Head Protection

Protective helmets commonly referred to as hard hats protect employees from head injuries caused by overhead hazards, falling or flying objects, swinging components such as backhoes, excavators, cranes, and electrical shocks or burns when working near electrical conductors which could contact the head. The protective helmet should be easily adjustable so employees will wear the hat properly.

Protective helmets worn by NCDOT personnel shall:

- Meet ANSI consensus standard Z89.1-2014 or subsequent versions.
- Resist a reasonable impact force without breaking or collapsing the shell or damaging the internal suspension
- Dissipate and/or absorb as much impact force as possible to avoid transmitting the force to the head, spinal column, or other parts of the body
- Resist impact penetration
- Be Class E to provide electrical protection to withstand 20,000 volts which may be present in overhead powerlines.
- Class E protective helmets shall be used for all NCDOT employees where a hard hat is required.

All NCDOT hard hats should be disposed of whenever the helmet has received impact or shows signs of deterioration.

It is mandatory that protective helmets be worn in all construction areas, including roads, shops, and outlying work areas where there is the potential exposure to overhead hazards, falling or flying material, swinging equipment components or exposure to live electrical conductors.

For certain tasks which Units may be involved, a typical hard hat may not be the most appropriate PPE since hard hats are subject to falling off. Protective helmets such as Kask helmets where chin straps are used to prevent them from falling off the head when the head is in awkward position during the task.

6.2.4 Eye and Face Protection

Eye and face protection protect employees from flying particles, molten metal, chemicals, injurious light radiation and impact to the face or eyes. To prevent injuries, many types of eye and face protection devices are available in NCDOT.

There are (4) basic types of eye and face protection used at NCDOT. These are :

- **Safety glasses with side shields or wrap around design**

 <p>Wrap Around Safety Glasses (Clear or Gray Tint)</p>	 <p>Over Spectacle Safety Glasses (Clear or Gray Tint)</p>
 <p>Safety Glasses w/ Seal & Headband (Clear or Gray Tint)</p>	 <p>Rx Reader Wrap Around Safety Glasses (Clear or Gray Tint)</p>

- **Safety goggles**



- **Face Shield**



- **Welding Helmets with minimum shade 10 filter lens**



Eye and face protection shall meet consensus standard ANSI/ISEA Z87.1-2010 or subsequent versions. Eye and face protection devices should protect against the intended hazard and be:

- Reasonably comfortable
- Fit properly
- Durable
- Capable of being disinfected
- Easy to clean
- In good repair

The eye and face protection required will depend upon the potential hazards.

All NCDOT employees must use appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

6.2.5 Hearing Protection

Exposure to high noise levels can cause hearing loss or impairment. There is no cure for noise-induced hearing loss, so the prevention of excessive noise exposure is required to avoid hearing damage.

Types of hearing protection devices used in NCDOT must have Noise Reduction Rating (NRR) label required by EPA Regulation 40 CFR PART 211 Subpart B showing effectiveness of reducing noise exposure.

The photos below represent types of hearing protection available from DOT Central Inventory or State Contract provider for safety supplies.

- **Ear Plugs**



- **Earmuffs**



6.2.6 Hand and Arm Protection

Hand and arm injuries account for a significant percent of workplace injuries. Hands and fingers are used to accomplish nearly all workplace activities and must be protected from injury. The types of gloves and protective sleeves used by DOT personnel may have to address the following hazards:

- **Leather Cowhide Gloves** for general work to prevent splinters, cuts, and abrasions.



- **Chemical Resistant Neoprene or Nitrile Gloves** when working with solvents, corrosives, and other chemicals. For total immersion, glove length needs to be adequate to protect hand and arm. Disposal nitril gloves should not be used for total immersion.



- **Cut-Resistant Gloves and Sleeves** are rated A2 (light cut protection – A5 (heavy cut protection). Photos below show A5 cut resistant gloves and sleeves for tasks (e.g. chainsaws, cutting tools) requiring better cut protection than offered by leather cowhide gloves.



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- **Mechanic Gloves** when working with vibration type power tools such as jack hammers and hand grinders.



- **Welding Gloves** to protect hands during welding and torch cutting operations.



- **Heat Resistant Gloves** when working with items being removed from ovens or other applications involving extremely hot items. Gloves should be rated for 500 °F.



- **Cryogenic Gloves** when filling propane cylinders.



- **High Voltage Insulated Gloves** if working near energized electrical exposure.



6.2.7 Foot and Leg Protection

Safety shoes are used to protect the feet against injuries from heavy falling objects, rolling objects, objects piercing the soles, electrical hazards, against crushing or against lacerations. They are required for employees whose job duties require the lifting, carrying, or moving of objects weighing more than fifteen pounds.

NCDOT employees who are required to wear safety shoes/boots may obtain them from Contracted Vendor Safety Shoe Truck visiting Divisions at no cost to the employee or will be reimbursed for self-purchases.

Current safety toe shoes or boots allowance for DOT:

1. \$150 each year
2. \$225.00 every two years
3. If employees are requesting reimbursement, the request must be submitted within 30 days of purchase.

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. The Unit or Division is responsible to cover cost for their employee in this case. 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.

All DOT employees required to operate chain saws are required to wear **Chain Saw Chaps** with wrap around calf protection. Chain saw chaps may also be required when operating brush cutters based on hazard assessment of the equipment being used.



6.2.8 Body Protection

Protective clothing is used to protect the body and personal clothing from potential exposures associated with work. Working in labs, maintenance, equipment, or welding shops are some areas requiring some type of protective clothing.

Personal protective vests, aprons, coats, pants, and coveralls should be worn consistent with the workplace hazard.

Protective Clothing may include coveralls, welding bib aprons or coats.



6.2.9 Respiratory Protection

DOT exposure to airborne contaminants or hazardous environments may require the use of respirators based on Hazard Assessments where OSHA Permissible Exposure Limits (PEL) are exceeded. Lead exposure for bridge structural work, respirable silica dust exposure on construction sites where respiratory protection may be required. Work tasks where exposure to welding fumes, paint solvents, and pesticides may also require respiratory protection.

The prevention of exposure to airborne contaminants at the worksite should be accomplished as far as feasible by engineering control measures (such as enclosing or confining the contaminant-producing operation, exhausting the contaminant, or substituting with less toxic materials). However, when engineering controls are not feasible, appropriate respirators must be used.

Respirators have their limitations and are not substitutes for effective engineering controls. No employee shall wear a respirator until they have completed the Respiratory Control Program. Refer to [SPP #1910.134, Respiratory Protection](#), for further details.

Employees required to wear respirators for specific tasks must complete a medical evaluation questionnaire which is reviewed by a professionally licensed healthcare professional (PLHCP) and be fit tested annually for type of respirator to be used. Workers must be clean-shaven for tight fitting respirators. Loose-fitting Powered Air Purifying Respirators does not require annual fit testing.

Each type of respirator has an Assigned Protection Factor (APF) that reduces the PEL by the APF level. The following are types of respirators with APF commonly used by DOT personnel based on Hazard Assessments for work tasks.

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1. Disposable Filtering Facepiece Respirator (APF-10) for use against nuisance dusts, mists, and fumes. They do not provide protection against gases and vapors.



2. Half Face Respirator w/ Filtering Cartridge (APF-10) with specific cartridge selection for specific airborne contaminant.



3. Full Face Respirator w/ Filtering Cartridge (APF-50) with specific cartridge selection for specific airborne contaminant.



4. Powered Air Purifying Respirator w/ Loose Fitting Helmet (APF-25) with specific cartridge selection for specific airborne contaminant.



5. Powered Air Purifying Respirator w/ Loose Fitting Hood (APF-25) with specific cartridge selection for specific airborne contaminant.



6.2.10 Fall Protection

Fall Protection devices are those devices and systems designed restrain a worker from reaching the fall point or arrest and stop a falling employee from contacting a lower level from an accidental fall from height.

The following fall protection PPE devices and systems are used in NCDOT:

- Fall Restraint System consisting of
 - Full Body Safety Harness (**Body Belts are not allowed**)
 - Anchor Point
 - Short Lanyard or Self-Retracting Lanyard (SRL)
- Fall Arrest System consisting of
 - Full Body Safety Harness (Body Belts are not allowed)
 - Anchor Point
 - Horizontal or Vertical Lifeline
 - Shock Absorbing Lanyard or SRL
 - Ladder Climbing Safety Devices

The following pictures illustrate Fall Protection system components.

Full Body Harness with Fall Arrest Lanyard

The full body harnesses with lanyard attached to an approved anchor point or lifeline are primary lifesaving fall protection devices for employees who working at height greater than 6' from the ground. The length of the lanyard must ensure employee will not contact the ground in the event of a fall.



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Anchor Point with required 5,000 lb. capacity.



Cross Strap Anchor



I-Beam Clamp Anchor



Fixed Anchor Point

Lanyards



Fixed Restraint



Shock Absorbing



Retractable



Dual Leg Shock Absorbing

Fall Restraint Ladder Climbing Device



Fall Protection Horizontal Lifeline



6.2.11 Use and Maintenance

All PPE must be kept clean and in reliable condition. PPE that is damaged or deemed to be not safe, must be replaced. All employees are to be trained in the proper use and maintenance of PPE.

Items which are fitted to the individuals shall not be reissued to other employees nor are they to be shared. Items that are owned by the employee and used on the job must be certified safe and reliable by NCDOT safety staff.

6.3 Specific Responsibilities

6.3.1 Managers/Unit Heads

Managers/Unit Heads are responsible for ensuring that adequate funds are available and budgeted for the purchase of PPE for their Units.

Managers/Unit Heads will also ensure compliance with PPE through their supervisors' auditing process.

6.3.2 Supervisors

Supervisors will be responsible for communicating appropriate needs to managers/unit heads.

Supervisors will ensure that employees are properly trained before using PPE and that they are being worn properly. Supervisors will ensure that no employee is allowed in a work environment without the proper protective equipment consistent with the hazard.

6.3.3 Employees

Employees shall comply with all applicable guidelines contained in this safety policy and procedure.

Employees are to report any unsafe act associated with this safety policy and procedure to their supervisors. Additionally, employees shall identify and report any hazards which may require PPE.

Employees who are assigned PPE are to keep them available and in good working order at all times and to have them replaced when they become worn or unsafe.

6.3.4 Safety & Risk Management

Safety and Risk Management will provide prompt assistance to managers/unit heads, supervisors, or others as applicable on any matter concerning this safety policy and procedure. Safety and Risk Management will assist in developing or securing required training. Safety and Risk Management will also provide assistance in performing hazard assessments.

Safety and Risk Management will also work with Purchasing and Central Equipment Unit to ensure that all newly purchased PPE comply with current safety regulations.

Safety Engineers will conduct hazard assessments and train other designated employees to perform hazard assessments. Additionally, Safety Engineers will provide consultative and audit assistance to ensure effective implementation of this safety policy and procedure.

6.3.5 Central Inventory

Central Equipment Unit and State Contract provider will support the Divisions/Units with the selection and availability of PPE.