

Fire Protection

SPP# 1910.157

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1.0 Purpose

The purpose of this safety policy and procedure is to establish the methods and accountability for fire protection and safety at North Carolina Department of Transportation (NCDOT) facilities.

2.0 Scope and Applicability

Fire protection is important to NCDOT to minimize loss of life and property. The cost of fire protection is small compared to potential costs of incalculable human suffering and lost property.

This safety policy and procedure provides guidelines for implementing fire protection in the workplace. It includes provisions for training, discussion on portable fire extinguisher’s classification and use, and information on fire hoses, water sprinkler systems, halon systems, and sprinkler system’s alarms.

This document also details the areas of responsibility for managers/unit heads, supervisors, and employees within NCDOT.

This safety policy and procedure applies to all employees.

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3.0 Reference

This safety policy and procedure is established in accordance with Occupational Safety and Health Standards for General Industry (29 CFR 1910.157).

4.0 Policy

It is the policy of NCDOT to provide a place of employment that is free from recognized hazards that cause or are likely to cause death or serious physical harm to employees or the public. Therefore, all NCDOT facilities will have fire protection equipment to minimize the results from fire hazards. When fire hazards exist that cannot be eliminated, then engineering practices, administrative practices, safe work practices, and proper training regarding Fire Protection will 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 policy on Fire Protection. It is also the responsibility of each NCDOT employee to report immediately any unsafe act or condition to his or her supervisor and to become familiar with the use and location of fire-fighting equipment. Specific responsibilities are found in Section 6.3.

6.0 Procedure

This section provides applicable definitions, establishes general provisions, and identifies specific responsibilities required by NCDOT's policy on Fire Protection.

6.1 Definitions

Class A Fires

Fires that involve ordinary combustible solids or "surface burning fires." Examples of Class A fires include wood, clothing, plastics, paper, and asphalt.

Class B Fires

Fires that involve gases, greases, and flammable combustible liquids. Examples of Class B Fires include gasoline, kerosene, alcohol, and lubricating oils and greases.

Class C Fires

Fires that involve electrical circuits of electrical equipment or fires near such equipment. Examples of Class C fires include electrical motors, switch boxes, junction boxes, transformers, and energized or live wires.

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Class D Fires

Fires that involve combustible metals which require special fire tactics and extinguishing agents. Class D fires include metals such as magnesium, potassium, powdered aluminum, zinc, sodium, and titanium.

Fixed Extinguishing System

A permanently installed system that either extinguishes or controls a fire within the area.

Halon

A colorless electrically nonconductive gas which is a medium for extinguishing fires by inhibiting the chemical chain reaction of fuel and oxygen.

Hydrostatic Testing

Testing performed on fire extinguisher cylinders to check the integrity of the cylinders.

Incipient Fires

Fires which are in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, standpipe or small hose system without the need for protective clothing or breathing apparatus.

Inspection

A visual check of fire protection systems and equipment to ensure that they are in place, charged, and ready for use in the event of fire.

Sprinkler System

A fire protection system with overhead discharge nozzles installed in a systematic pattern that ejects an extinguishing medium from ceiling to floor level.

6.2 General Provisions

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

- Training
- Portable Fire Extinguishers
- Fire Hoses
- Water Extinguishing Sprinkler Systems
- Halon Extinguishing Systems
- Fire Alarms and Alarms for Sprinkler Systems

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6.2.1 Training

Employees will be trained on the general principles of fire protection upon initial employment and annually thereafter. Training will consist of:

- Classification, Ratings, and Performance of Fire Extinguishers
- Classification of Hazards
- Purpose of Hydrostatic Testing of Fire Extinguishers
- How Water Systems Work
- How CO₂ and Halon Extinguishing Systems Operate
- Location of Fire Exits and Escape Routes
- Use of Fire Extinguishers
- Purpose and Typical Operations of Alarm Systems

Additionally, supervisors or designated employees will be trained in:

- Selection and Distribution of Extinguishers
- Inspection, Maintenance, and Recharging of Extinguishers

6.2.2 Portable Fire Extinguishers

NCDOT shall provide portable fire extinguishers that are:

- Consistent with the hazard
- Properly mounted and located
- Inspected, maintained, and tested

Portable fire extinguishers will be selected and distributed based on the classes of anticipated fires, and the size and degree of hazard. Most fires in NCDOT operations will include materials found in Classes A, B, and C. Thus, the most common type of extinguisher NCDOT will provide will be designed to effectively suppress these particular conditions. However, fire extinguishers for Class D fires will be provided when hazards associated with Class D fires exist. Halon fires extinguishers will be provided to extinguish Class C fires involving computers and related equipment. See Figure 1 for the different types of fire extinguishers.

Portable fire extinguishers will be mounted conspicuously, located and identified so they are readily accessible. Extinguisher locations will be carefully selected to ensure extinguishers are adequately spaced and are not in danger of being damaged by vehicles, weather, or storage materials.

Employees will be informed of the location of fire extinguishers. Extinguishers will be visible from a distance of at least 3 feet. Wall markings for fire extinguisher locations will be visible from a distance of at least 25 feet.

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They shall be located along normal paths of travel, including exits from an area. All paths to fire extinguishers must remain clear to provide easy access. For related information, refer to [SPP# 1910.38, Emergency Evacuation and Fire Prevention Plans.](#)

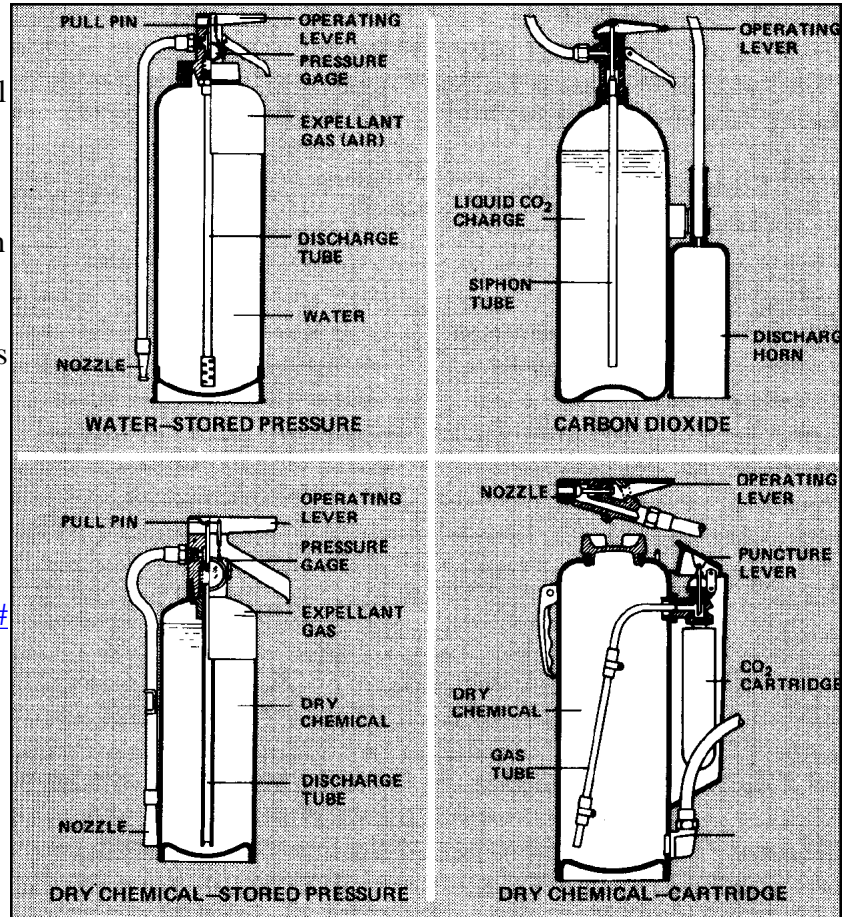


Figure 1

Portable fire extinguishers shall be visually inspected monthly to ensure they are charged and operable. They are to be recharged after use or pressure leakage. Fire extinguishers will be equipped with an inspection tag, and the inspector must initial and date the tag each month to document the inspection. Tags will be replaced when all lines are used or when tags are lost or removed.

Any extinguisher that shows excessive wear, damage or unserviceable condition will be removed from service and replaced by an operable extinguisher.

Fire extinguisher maintenance will be performed at least annually by an approved contractor or trained NCDOT personnel.

During any period when an extinguisher is removed from service for testing, another extinguisher must replace the extinguisher out for testing.

Annual inspection records will be maintained for review by regulatory agencies and for internal audit purposes. Appendix A presents the portable fire extinguisher hydrostatic testing schedule for NCDOT.

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6.2.3 Water Extinguishing Sprinkler Systems

Water extinguishing systems are fixed extinguishing systems used in areas requiring a higher degree of fire protection than is provided by fire extinguishers. These are heat-activated systems with automatic water supplies and overhead ceiling mounted sprinklers. Upon being activated, these water extinguishing systems discharge water over the fire area. Water extinguishing systems will be inspected annually by an approved outside contractor to ensure their operation is sufficient.

6.2.4 Halon Extinguishing Systems

Halon extinguishing systems are also considered fixed extinguishing systems. They are used in areas that contain large quantities of computer or other sensitive equipment susceptible to permanent water damage. Halon systems, designed to deplete oxygen from the area thus extinguishing the fire, will be inspected annually by an approved outside contractor to ensure their operation is sufficient.

6.2.5 Fire Alarms and Alarms for Sprinkler Systems

Facilities in areas where municipal fire departments are available may have an alarm box located in the building. Other facilities, which may contain several buildings, may have auxiliary alarm boxes connected to the municipal fire alarm system at various points in the facility.

Water sprinkler and halon systems will be equipped with an audible alarm designed to alert employees that the systems have been activated.

Water sprinkler system alarms can be activated either by the heat detection system or by the flow of water through the sprinkler. Therefore, the alarm will sound approximately the same time water is discharged from the sprinklers.

Halon systems will have a pre-discharge alarm capable of being perceived above noise levels. This audible alarm will sound in time for all employees to safely exit the discharge area prior to the system discharge. Additionally, this audible alarm should continue after the halon discharge until positive action has been taken to acknowledge the alarm.

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6.3 Specific Responsibilities

6.3.1 Managers/Unit Heads

Managers/Unit Heads are responsible for budgeting and ensuring that adequate funds are available for the purchase of portable fire extinguishers for their respective work places. For newer NCDOT facilities with water and/or halon sprinkler systems, managers/unit heads will ensure service contracts are in place for the annual servicing of these systems and the audible alarms associated with them.

They will also be responsible for identifying the employees affected by this safety policy and procedure. Managers/Unit Heads will obtain and coordinate the required training for the affected employees.

Managers/Unit Heads will also audit their fire protection program for compliance with this safety policy and procedure. Managers/Unit Heads should refer to [SPP # 1910.38, Emergency Evacuation and Fire Prevention Plans](#), for related information on fire prevention.

6.3.2 Supervisors

Supervisors will ensure that employees are trained in the general principles of fire protection and the use and function of various fire protection equipment. Additionally, they shall ensure that there are an adequate number of portable fire extinguishers for each work area. Supervisors should refer to [SPP #1910.38, Emergency Evacuation and Fire Prevention Plans](#), for related information on fire prevention.

Supervisors will ensure that fire extinguishers are recharged after each use. They will also ensure that damaged or defective fire extinguishers are removed from service and replaced. Supervisors will also ensure that monthly and annual testing and maintenance is performed on the portable fire extinguishers. Records of inspections and testing shall be maintained and retained by the supervisor.

Supervisors may have designated employee trained to assume some of their responsibilities for fire extinguisher selection, distribution, inspection, maintenance, and testing.

6.3.3 Employees

Employees are responsible for reporting fire hazards to their supervisors. **Actual fires will be reported immediately to the local fire department before any attempts are made to extinguish the fire. Employees will not attempt to extinguish fires beyond the incipient stage.**

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6.3.4 Safety and Loss Control

Safety and Loss Control will provide prompt assistance to managers/unit heads, supervisors or others as necessary on any matter concerning this safety policy and procedure. Safety and Loss Control will assist in developing or securing the required training. Safety and Loss Control will work with Purchasing and Central Equipment Unit to ensure that all newly purchased fire extinguishers comply with fire protection standards and this safety policy and procedure.

Additionally, Safety Engineers will provide consultative and audit assistance to ensure effective implementation of this safety policy and procedure. Safety and Loss Control Safety Engineers will assist managers/unit heads and supervisors with the selection of proper types and locations for fire extinguisher placement for new buildings and renovations.

6.3.5 Central Equipment Unit

Central Equipment Unit will maintain a supply of replacement portable fire extinguishers including those rated for types A, B, and C hazards. Class D extinguishers will be made available only after consultation with Safety and Loss Control.

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APPENDIX A: Portable Fire Extinguisher Hydrostatic Testing Schedule

Types of extinguishers	Test interval (years)
Soda acid (stainless steel shell)	5
Cartridge operated water and/or antifreeze	5
Stored pressure water and/or antifreeze	5
Wetting agent	5
Foam (stainless steel shell)	5
Aqueous Film Forming Foam (AFFF)	5
Loaded stream	5
Dry chemical with stainless steel	5
Carbon Dioxide	5
Dry chemical, stored pressure, with mild steel, brazed brass or aluminum shells	12
Dry chemical, cartridge or cylinder operated; with mild steel shells	12
Halon 1211	12
Halon 1301	12
Dry powder, cartridge or cylinder operated with mild steel shells	12