LI. FORMS

Form 1 – Hepatitis B Vaccine – Acceptance
Form 2 – Hepatitis B Vaccine – Declination Statement
Form 3 – Hazardous Materials Inventory List (Blank)
Form 4 – Confined Space Assessment
Form 5 – Non-Permit Confined Space Reclassification Certification
Form 6 – Permit-Required Confined Space Entry Permit
Form 7 – Fall Protection Plan Checklist
Form 8 – Emergency Telephone Numbers
Form 9 – Job Hazard Analysis Form
Form 10 – Job Safety/Hazard Analysis Worksheet
Form 11 – Hazard Recognition Form
Form 12 – Laboratory Safety Checklist
Form 13 – Lockout/Tagout Initial Survey
Form 14 – Lockout/Tagout Observation Form
Form 15 – Lockout/Tagout Procedure Form
Form 16 – Access to Employee Exposure and Medical Records
Form 17 – Accident/Incident Report
Form 18 – Motor Vehicle Supervisor's Accident Investigation Report
Form 19 – Risk Management Accident/Incident Report
Form 20 – Safety Committee Recommendations
Form 21 – Playground Equipment Procurement and Installation Approval Form
Form 22 – Initial Playground Safety Audit Form
Form 23 – Daily Playground Inspection Checklist
Form 24 – Playground Accident/Incident Report
Form 25 – Personal Protective Equipment Survey and Assessment
Form 26 – Forklift/Motorized Hand Truck Daily Inspection Report
Form 27 – OSHA Appendix C to 1910.134, Respirator Medical Evaluation Questionnaire
Form 28 – Respirator Program Evaluation Form
Form 29 – Monthly Inspection Checklist

LII. APPENDICES

LIII. A: Approved Chemical List

Section 1: Asbestos

1.1 Introduction

School Board of Brevard County employees may encounter asbestos in materials that they work with during maintenance, repair or demolition activities. Since long-term exposure to high levels of asbestos fibers can cause serious chronic illnesses, it is important that a program to reduce or eliminate employee exposures is implemented. In addition to the following information, employees who are involved in the removal of materials containing asbestos must follow the guidelines shown in the School Board's *General Asbestos Removal Specification.*

29 CFR 1910.1001 29 CFR 1926.1101

1.2 Health Hazards of Asbestos

Asbestos is a material that belongs to a family of naturally occurring silicate minerals with a fibrous structure that breaks into very tiny fibers. Studies have shown that prolonged exposure through inhalation or ingestion of these fibers, can result in serious diseases, such as:

- ***Asbestosis*** - a fibrotic lung disease
- ***Lung cancer***
- ***Mesothelioma*** - a cancer of the membranes covering lungs and organs
- ***Gastrointestinal cancer***

Evidence suggests that the risk of lung cancer among exposed workers who smoke cigarettes is increased by as much as 90%.

1.3 Employees with Potential Asbestos Exposure

1.3.1 The following Brevard School Board employees may have potential occupational exposure to asbestos:

- Maintenance employees who are repairing or replacing piping that may contain asbestos.
- Fleet repair and service employees, who inspect, repair, assemble or disassemble brakes that may contain asbestos.
- Maintenance employees who are repairing or replacing ceiling tiles, flooring, roofing, etc.
- Any employees who are participating in building demolition activities, including housekeeping or cleanup.
- Employees who may be involved with the removal of thermal system insulation (TSI) or other asbestos-containing material (ACM).

1.4 Identifying Asbestos in the Workplace

It is not always possible to tell if certain materials contain asbestos; this can only be determined by testing, so it is important that employees assume that asbestos is present in certain types of materials (see list below) until it is otherwise verified.

1.4.1 Verification Procedure

If a School Board of Brevard County employee is tasked with impacting a building material that may contain asbestos, the work may not be performed until it has been determined that the materials do not contain asbestos. To verify whether a specific material is (or is not) asbestos containing, the employee must contact the School Board, Office of Environmental Health and Safety and identify the material(s) to be impacted. A specialist within that office with determine if the subject material(s) is/are asbestos containing. The specialist will typically reference existing asbestos survey data (site specific AHERA Management Plan Document) and/or confirmation bulk sampling data.

1.4.2 the following materials present in the workplace may contain asbestos:

Surfacing materials, which are found in ceilings, walls and structural members in buildings constructed *prior to 1981*;
Thermal System Insulation (TSI) commonly found in pipe work, valves, elbows or ductwork, installed *prior to 1981*;
Ceiling tiles, floors tiles, linoleum-vinyl flooring, baseboards and adhesives, installed *prior to 1981*;
Roofing materials, including felts, tarpaper or shingles;
Casketing materials;
Exterior sidings, (cementitrous panels);
Fire doors, partitions, lab apparatus and equipment;
Brake linings and clutch pads;
Caulking material (typically found between door/window frame and wall);
Windowpane glazing/putty.

The above list of building materials is a sample representation of the most common forms of asbestos-containing building materials. Many other types of building materials not listed may also contain asbestos.

Asbestos is most hazardous when it crumbles easily or is "friable" and some materials are more friable than others. For example, sprayed on insulation is easily friable but floor tile is not. It is important to remember that the more friable a substance, the greater the release of fibers and the greater the hazard.

1.5 Medical Surveillance

1.5.1 General

- Employers are required to institute a medical surveillance program for all employees who are or who may be exposed to asbestos at or above the PELs and who perform Class III asbestos work for a cumulative total of 30 days or more per year. *With the exception of trained Environmental Specialists working within the Office of Environmental Health and Safety, this section does not apply to the average employee.*

Permissible Exposure Limits (PELs):

- √ Time Weighted Average (TWA) = 0.1 f/cc of air averaged over an eight hour day
- √ Excursion Limit = 1.0 f/cc of air averaged over 30 minutes

- Medical examinations and procedures are to be performed under the supervision of an approved licensed physician, at a reasonable time and place at no cost to the employee. ***The routine examination must include:***

  - √ Medical and work histories with emphasis on symptoms of the respiratory system, cardiovascular system and digestive tract;
  - √ A completed *Respiratory Disease Questionnaire*;
  - √ A physical examination, including a chest x-ray and pulmonary function test (PFT).
- The employer must provide the physician with:

  - √ A copy of *OSHA 29 CFR 1910.1001* or *29 CFR 1926.1011* and the related *Appendices* (including *Appendix D* the mandatory *Medical Questionnaire*);
  - √ A description of the employee's duties as they relate to asbestos exposure;
  - √ The potential exposure level;
  - √ Personal protective equipment (PPE) and respiratory protection equipment to be used;
  - √ Information from previous medical examinations, if not otherwise available.

- The employer must obtain a **written** opinion from the physician containing the following information:

  - √ The results of the medical examination;
  - √ The physician's opinion as to whether the employee has any detected medical conditions that would increase the risk of exposure-related disease;
  - √ Any recommended limitations on the employee, including limits on the use of PPE;
  - √ A statement that the employee has been informed of the results of the examination and of any medical conditions related to asbestos exposure.
- **Pre-placement examinations** must be provided or made available to employees assigned to an occupation exposed to airborne concentrations at or above the TWA and/or excursion limit.
- **Periodic medical examinations** must be made available to employees covered by this Section annually.
- **Termination of employment examinations** must be provided or made available to employees who may have been exposed to airborne concentrations at or above the TWA and/or excursion limit.

1.6 Waste Disposal

- Asbestos waste, scrap, debris, containers, equipment and asbestos-contaminated clothing, consigned for disposal, is to be collected and disposed of in sealed, impermeable containers.
- Containers are to be properly labeled with the warning, "DANGER - CONTAINS ASBESTOS FIBERS."
- Contaminated clothing must be disposed of in sealed, impermeable bags or containers and properly labeled.
- Vacuum bags or disposable paper filters are not to be cleaned, but need to be sprayed with fine water mist and placed into a properly labeled waste container.
- Process waste and housekeeping waste is to be wet with water or a mixture of water and surfactant prior to packaging in disposable containers.
- Empty shipping bags must be flattened under exhaust hoods and packed into airtight containers for disposal. Empty shipping drums must be sealed.
- Asbestos-containing material (ACM), which has been removed from buildings, must be disposed of in leak-proof six mil plastic bags, plastic-lined cardboard containers, or plastic-lined metal containers. These wastes, which are to be removed while wet, must be sealed in containers before they dry out to minimize the release of asbestos fibers during handling.

If contaminated clothing is given to anyone to clean, they must be informed of the requirement to prevent the release of airborne asbestos fibers.

1.7 Labels and Signs

1.7.1 Labels

- Labels must be affixed to containers, or the materials themselves, if they contain asbestos fibers, such as:
  - √ Raw materials
  - √ Mixtures
  - √ Scrap
  - √ Waste
  - √ Debris
  - √ Contaminated clothing
- Labels are to include:
  - √ The signal word "DANGER";
  - √ The principle message "CONTAINS ASBESTOS FIBERS".
- The label must include hazard warnings, such as:
  - √ "AVOID CREATING DUST";
  - √ "MAY CAUSE CANCER AND LUNG DISEASE".

Labeling requirements do not apply where asbestos fibers have been modified by a bonding agent, coating, binder or other material which prohibits airborne concentrations of asbestos in excess of PELs to be released during handling, storage, disposal, transportation, etc., or if asbestos is present in concentrations of less than 1%.

1.7.2 Signs

- Signs must be displayed in each location where airborne concentrations of asbestos fibers may be in excess of the PELs.
- Signs are to be posted at a distance from the work area so that an employee may read the signs and take the necessary precautions ***before entering the area***.
- All approaches to regulated areas must be posted with signs.
- Signs must include the following:
  - √ "DANGER ASBESTOS";
  - √ "CANCER AND LUNG DISEASE HAZARD";
  - √ "AUTHORIZED PERSONNEL ONLY".

1.7 Labels and Signs - Continued

1.7.2 Signs - Continued

- In addition, if respirators and protective clothing are required, signs must indicate this by including the following:
  - √ "RESPIRATORS AND PROTECTIVE CLOTHING REQUIRED IN THIS AREA".

1.8 Training

1.8.1 General

- Training must be provided prior to or at the time of initial assignment and at least **annually** thereafter.
- In addition to the above training, the Brevard County School Board will provide the following information, upon request, to affected employees:

  A copy of the applicable Standard, either *OSHA 29 CFR 1910.1001* or *29 CFR 1926.1101* and associated *Appendices*;
  All information pertaining to training;
  Smoking cessation program materials (approved by public health organizations).

1.8.2 Awareness Level Training

This training is required for employees who must perform housekeeping (non-construction) duties and Class IV (construction) work near ACM or PACM, regardless of expected exposure levels. This level of training must include:

- √ The potential hazards and health effects of asbestos exposure;
- √ The hazards of smoking and asbestos exposure;
- √ The use of respiratory protection;
- √ Locations of asbestos materials and how to recognize signs of damage;
- √ Who to contact and what to do if materials are dislodged or become non-intact;
- √ The Permissible Exposure Limits (PELs).

1.8 Training - Continued

1.8.3 Basic Asbestos Level Training

This training is required for employees who must perform Class III (construction) work, must be a *minimum of **16** hours*, and include hands-on training and the following:

- √ All topics included in the *Awareness Level Training;*
- √ Methods for recognizing asbestos;
- √ Potential health effects associated with asbestos exposure;
- √ Operations that could result in exposure;
- √ Exposure monitoring procedures;
- √ Engineering controls and safe work practices;
- √ Protective measures;
- √ Protective clothing requirements;
- √ Waste disposal procedures;
- √ Housekeeping procedures;
- √ Labels and signs;
- √ Medical surveillance program;
- √ Review of *OSHA Construction Standard, 29 CFR 1926.1011* and associated *Appendices.*

1.8.4 General Asbestos Training

This training is required for employees who must perform work that may expose them to asbestos fibers that exceed the PELs. This level must contain, at a minimum, the following:

- √ All topics included in the *Awareness Level Training;*
- √ All topics included in *Basic Asbestos Training;*
- √ Review of *OSHA General Industry Standard, 29 CFR 1910.1001* or *OSHA Construction Standard, 29 CFR 1926.1011* and associated *Appendices.*

1.8.5 Competent Person Asbestos Training

This training is required for employees who must supervise work as shown in this *Section*. The following minimum training is required by *OSHA Construction Standard, 29 CFR 1910.1011*:

- √ All items included in *Awareness Level Training*;
- √ All items included in *General Asbestos Training*;
- √ In addition, training is to include training in how to recognize potential hazards and select controls to reduce or eliminate them.

1.9 Definitions

Asbestos - includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these materials that have been chemically treated and/or altered.

Asbestos-Containing Material (ACM) - any material containing more than 1% asbestos.

Authorized Person - any person authorized by the employer and required by work duties to be present in regulated areas.

Class I Asbestos Work - activities involving removal of Thermal System Insulation (TSI) and surfacing ACM and presumed asbestos-containing material (PACM).

Class II Asbestos Work - activities involving removal of ACM that is **not** TSI or surfacing material, such as wallboard, floor tile, roofing, siding, shingles, construction mastics, etc.

Class III Asbestos Work - repair and maintenance operations, where ACM (which may include TSI and surfacing ACM and PACM) is likely to be disturbed.

Cl*ass IV Asbestos Work* - maintenance and custodial operations during which employees contact, but **do not disturb** ACM or PACM and activities that involve cleaning up dust, waste and debris from Class I, II and III work.

Competent Person - one capable of identifying asbestos hazards in the workplace and of selecting the appropriate control strategy for asbestos exposure and who has the authority to take prompt corrective actions to eliminate those hazards. MUST BE TRAINED CONSISTENT WITH *EPA 40 CFR 763.92*.

Demolition - wrecking or taking out of any load-supporting structural member and related razing, removing or stripping of asbestos products.

Disturbance - activities that disrupt the matrix of ACM or PACM, or crumble, pulverize, or generate visible debris. Cutting away small amounts, no greater than the amount that can be contained in one standard sized glove bag or waste bag (60 inches wide x 60 inches long) in order to access a building component.

Employee Exposure - exposure to airborne asbestos that could occur without the use of a respirator.

High-Efficiency Particulate Air (HEPA) Filter - a filter capable of trapping and retaining 99.97% of 0.3 micrometer diameter mono-dispersed particles.

Intact - ACM that has not been crumbled, pulverized or deteriorated so that it is no longer bound by its matrix.

Negative Initial Exposure Assessment - a demonstration by an employee, which complies with the criteria, which shows that employee exposure during an operation, is expected to be consistently below Permissible Exposure Limits (PELs).

Presumed Asbestos-Containing Material (PACM) - TSI and surfacing material found in buildings constructed prior to 1980.

Regulated Area - an area established by the employer to identify where Class I, II and III asbestos work is to be conducted and any adjoining area where debris and waste from such work may accumulate. May also include a work area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility that they may exceed, the PELs.

Removal - all operations (including demolition operations) where ACM and/or PACM are taken out or stripped from structures or substrates.

Repair - overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

Surfacing Material - material that is sprayed, troweled on or otherwise applied to surfaces (such as acoustical plaster on ceilings, fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing and other purposes).
Surfacing ACM - surfacing material that contains more than 1% asbestos.
Thermal System Insulation (TSI) - ACM applied to pipes, fittings, boilers, tanks, ducts or other structural components to prevent heat loss or gain.
Thermal System Insulation ACM - TSI that contains more than 1% asbestos.

1.10 Recordkeeping

1.10.1 Records Retention

Record	Maintained By	Retention
Medical Records	**Occupational Health Clinic**	**Length of Employment + 30 Years**
Training	**Environmental Health and Safety Office**	**Length of Employment + 1 Year**
Exposure Monitoring/Assessment Records	**Industrial Hygienist**	**30 Years**

Section 2: Bloodborne Pathogens

2.1 Introduction

The School Board of Brevard County recognizes that some employees may encounter non-routine occupational exposure to bloodborne pathogens, including the Hepatitis B Virus (HBV), the Hepatitis C Virus (HCV), and the Human Immunodeficiency Virus (HIV).

This written Exposure Control Program has been developed to minimize or eliminate employee exposure to blood and/or other potentially infectious materials and is intended to comply with the requirements of the *OSHA Standard 29 CFR 1910.1030, Bloodborne Pathogens.*

29 CFR 1910.1030 **F.A.C. 64E-16**

2.2 Definitions

Blood - Human blood, blood components and products made from human blood.
Bloodborne Pathogens - Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and Human Immunodeficiency Virus (HIV).
Contaminated - The presence or the reasonably anticipated presence of blood and/or other potentially infectious materials on an item or surface.

Contaminated Laundry - Clothing, linens, etc. that have been soiled with blood and/or other potentially infectious materials or may contain sharps.
Contaminated Sharps - Any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broke capillary tubes and exposed ends of dental wires.
Decontamination - The use of physical or chemical means to remove, inactivate or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious articles and the surface or item is rendered safe for handling, use or disposal.
Engineering Controls - Controls that isolate or remove the bloodborne pathogens hazard from the workplace (i.e., sharps disposal containers, self-sheathing needles, etc.)
Exposure Incident - A specific eye, mouth, other mucous membrane, non-intact skin or parenteral contact with blood and/or other potentially infectious materials that results from the performance of an employee's duties.
Occupational Exposure - Reasonably anticipated skin, eye, mouth, other mucous membrane, or parenteral contact with blood and/or other potentially infectious materials that may result from the performance of an employee's duties.
Other Potentially Infectious Materials - (1) The following human bodily fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any bodily fluid that is visibly contaminated with blood, and all bodily fluids in situations where it is difficult or impossible to differentiate between bodily fluids; (2) Any unfixed tissue or organ (other than intact skin) from a human, either living or dead; (3) HIV-containing cell or tissue cultures, organ cultures and HIV- or HBV-containing culture medium or other solutions; and (4) Blood, organs, or other tissue from experimental animals infected with HIV or HBV.
Parenteral - The act of piercing mucous membranes or the skin barrier through such events as needle sticks, human bites, cuts and abrasions.
Personal Protective Equipment (PPE) - Specialized clothing or equipment worn by an employee for protection against a hazard or a potential hazard.
Regulated Waste - (1) Liquid or semi-liquid blood and/or other potentially infectious materials; (2) contaminated items that would release blood and/or other potentially infectious materials in a liquid or semi-liquid state if compressed; (3) items that are caked with dried blood and/or other potentially infectious materials and are capable of releasing these materials during handling; (4) contaminated sharps; and (5) pathological and microbiological wastes containing blood and/or other potentially infectious materials.
Source Individual – Any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee.
Sterilize – The use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores.
Universal Precautions - An approach to infection control that hinges on the concept that all human blood and certain human bodily fluids are to be treated as if they are known to be infectious for HIV, HBV, HCV and other bloodborne pathogens.
Work Practice Controls - Controls that reduce the likelihood of exposure by altering the manner in which a task is performed (i.e., prohibiting recapping of needles by a two-handed technique).

2.3 Responsibilities

2.3.1 Principals, Facility Managers or their Designees Must:

- Provide a written *Exposure Control Plan*.
- Determine which employees and job classifications have the potential for occupational exposure to blood and/or other potentially infectious materials.
- Ensure that all covered employees receive training **annually** and maintain the necessary documentation.
- Provide Hepatitis B vaccinations to all employees with potential occupational exposure to blood and/or other potentially infectious materials.
- Provide the necessary personal protective equipment (PPE) and train employees to properly select use and maintain it.

2.3.2 Exposure Control Program Coordinator

- Each school or department is to designate an Exposure Control Program Coordinator (see the Site Specific Section) who will be responsible for enforcement, **annual** review (more frequently if there are any equipment, procedural or statutory changes) and maintenance of their program.

2.4 Exposure Determination

Principals, Facility Managers or their designees must identify employees and job classifications with potential occupational exposure. This exposure determination is to be made without regard to the use of personal protective equipment (PPE).

2.4.1 The following are examples of School Board of Brevard County employees who may have potential occupational exposure to blood and/or other potentially infectious materials as part of their regular job duties:

1) School Nurses
2) Clinic Volunteers
3) Exceptional Education Staff (teachers, therapists and assistants)
4) Custodial and Maintenance Employees
5) Security Guards (except after hours security)
6) Selected Bus Drivers and Aides
7) Athletic Coaches and Physical Education Teachers
8) School Staff or Department Employees Required to be First Aid and/or CPR Certified

A list of employees with potential occupational exposure to blood and/or other potentially infectious materials for each specific location is to be maintained in the Site Specific Section of this Plan. This list is to include the employee name, job classification and tasks or procedures where exposure may occur. It is to be updated whenever tasks, procedures or job changes are made that will affect the employee's potential exposure and whenever new employees are assigned to tasks or jobs that have been identified as having the potential for exposure. This listing needs to be reviewed at least annually.

2.5 Training

2.5.1 General

It is the responsibility of each school and/or department to ensure that employees receive adequate training and information to eliminate or minimize potential exposure. In addition, employees who handle biohazardous waste must be effectively trained to do so.

- Scheduling all employees who have been identified with exposure potential during the hazard determination process, to participate in a training program at the time of initial assignment and **annually** thereafter. Training must be scheduled during working hours and provided at no cost to the employee. Additional training may be necessary if there are procedural or equipment changes that may impact whether an employee has the potential for exposure.
- Recording attendance at training sessions.
- Maintaining records of training classes on file for a minimum of three years.
  - *Records must include:*
    1) The date of the class;
    2) Name and qualifications of the instructor(s);
    3) Names and job titles of attendees;
    4) Program content (including a copy of the *Exposure Control Plan*, course outline or syllabus, listing of videotapes used, and copies of other materials presented).

2.5.3 The following information is to be presented at each training session:

Summary of *OSHA 1910.1030 Bloodborne Pathogen Standard*;
Summary of the *Exposure Control Plan,* including Site Specific information;
Definition and identification of bloodborne diseases;
Means in which bloodborne diseases could be transmitted;
Where and how occupational exposures might occur;
How potential exposures can be prevented;
How personal protective equipment (PPE) is to be selected, used, cleaned and disposed of;
When personal protective equipment (PPE) is to be used;
How effective the Hepatitis B vaccine is and who provides it;
How the employee should respond to an emergency involving potential exposure;
What actions are to be taken following an exposure incident;
Post-exposure evaluation and follow-up procedures;
What tags, signs, labels, etc. are required for storage and disposal containers and how they are to be used;
Proper procedures for safe and proper handling of biohazardous waste.

2.5.4 Instructor Requirements

- Those who conduct the training must be knowledgeable in the subject matter and allow opportunities for interactive questions and answers during training sessions.

2.6 Hepatitis B Vaccination

2.6.1 General

In order to comply with OSHA 29 CFR 1910.1030 and to provide protection to its employees, the School Board of Brevard County will offer those employees determined to have potential occupational exposure, the Hepatitis B vaccination series at no cost, after they have received the required training and within ten days of initial assignment.

The only exceptions to this requirement are:

1) The employee has previously received the **complete** Hepatitis B vaccination series. If so, the employee completes and signs the bottom section of the *HBV Acceptance or Declination Form*. (A copy of both forms may be found in the *Forms Section* of this Plan)
2) If antibody testing shows that the employee is immune. Documentation of immunity must be maintained in the employee's medical file. (Vaccination pre-screening is not required but may be offered.)
3) The vaccine is not recommended for medical reasons. Documentation of the reasons must be maintained in the employee's medical file.

Any employee who declines to accept the offered vaccination must sign the required declination statement. (See the *HBV Declination Form* in the *Forms Section* of this Plan.) This does not nullify the employee's right to receive the vaccination at a later date, if at that time they are still covered under the standard.

If a routine booster dose(s) of Hepatitis B vaccine is recommended by the U.S. Public Health Service at a future date, such booster dose(s) will be made available as required.

2.7 Labels

2.7.1 Requirements

Biohazard warning labels must be available in all clinics and attached to:

Contaminated waste receptacles;
Sharps disposal containers;
Containers (including refrigerated units) used to store blood and/or other potentially infectious materials;
Containers used to ship blood and/or other potentially infectious materials;
Potentially contaminated equipment and/or machinery;
Bags containing contaminated waste (such as material saturated or dripping with blood or caked with dried blood);
Contaminated laundry to be sent off-site for cleaning.

A red bag may be used without the biohazard-warning label IF the employees and the waste contractor understand that "red bagging" indicates that the material contained in it is potentially infectious.

2.7.2 Label Design

The biohazard label must be fluorescent orange or orange-red with contrasting letters and symbols.

2.8 Personal Protective Equipment (PPE)

2.8.1 General

- Where potential occupational exposure remains after establishing engineering and work practice controls, personal protective equipment (PPE) must be used.
- PPE will be readily accessible at each work site or issued to employees as needed. Employees will be informed of the locations of such equipment during initial and annual training.
- PPE will be provided at no cost to employees.
- Damaged PPE must not be used but discarded or repaired as needed to maintain effectiveness.

2.8.2 Types of Personal Protective Equipment (PPE)

√ **Latex Gloves** - must be used when it is anticipated that an employee may have hand contact with blood and/or other potentially infectious materials or when handling or touching contaminated items or surfaces. (***Note:*** *Some employees may be allergic to latex and must be offered a comparable hypoallergenic alternative*).

√ **Utility Gloves** - must be worn over latex gloves (or a comparable alternative) during clean-up processes, decontamination and custodial duties, or when working where contact with contaminated sewage is anticipated.

√ **Safety Glasses with Side shields or Goggles** - must be worn when splashing or spattering of blood and/or other potentially infectious materials could occur.

A face shield must be worn if areas not covered by safety glasses or a surgical mask may be exposed to blood and/or other potentially infectious materials through splashes, spraying, splatter or droplets.

2.8 Personal Protective Equipment (PPE) – Continued

2.8.2 Types of Personal Protective Equipment (PPE) – Continued

√ **Surgical Mask** - must be worn to protect the mucous membranes (i.e. nose, mouth and eyes) when splashing or spattering of blood and/or other potentially infectious materials could occur.

√ **CPR Micro screen** - is to be used when performing Cardiopulmonary Resuscitation.

√ **Clinical Jackets, Lab Coats or Gowns** – if necessary for protection and depending upon the degree of potential exposure, this protective clothing is to be worn.

Personal protective equipment is to be removed prior to leaving the work area and decontaminated or discarded. Garments penetrated by blood or other potentially infectious materials are to be removed immediately (or as soon as possible after exposure) and placed in properly labeled or red biohazard bags for laundering.

2.9 Exposure Control Procedures

2.9.1 Universal or Standard Precautions

- The Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and other bloodborne diseases may be carried by anyone **without visible symptoms**; therefore, it is essential that employees treat all human blood and/or other potentially infectious materials as if they are infectious.

2.9.2 Engineering Controls

The following engineering controls must be provided to minimize or eliminate the potential for an employee's occupational exposure to blood and/or other potentially infectious materials:

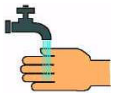
1) Hand-washing facilities, cleansing soap and disposable towels must be located at work sites and readily accessible. Antiseptic towelettes may be used if such facilities are not feasible. *If antiseptic towelettes are used, hands must be washed with soap and running water as soon as possible*.
2) Sharps disposal containers which are closable, puncture-resistant, leak-proof and labeled with a biohazard label (for broken glass, syringes and contaminated sharp objects) must be provided and easily accessible.
3) Only mechanical pipetting devices (if necessary) are to be used.
4) Routine inspection/maintenance of engineering controls must be scheduled and conducted.

2.9 Exposure Control Procedures - Continued

2.9.3 Work Practice Controls

The following practices are to be followed in order to minimize and/or eliminate employees' potential occupational exposure to blood and/or other potentially infectious materials:

2.9.3.1 General



1) Employees are to wash their hands and any other skin with soap and water, or flush mucous membranes (i.e. nose, mouth, eyes) with water **immediately** following contact with blood and/or other potentially infectious materials.
2) Antiseptic towelettes or hand cleanser must be provided if hand-washing facilities are not available. (*If these alternatives are used, hands are to be washed with soap and running water as soon as possible*.)
3) Eating, drinking, smoking, applying cosmetics or lip balm and handling contact lenses are **prohibited** in work areas where there is a reasonable likelihood for occupational exposure. *Food and drinks are not allowed in areas where blood and/or other potentially infectious materials may be present.*
4) Procedures are to be conducted to minimize splashing or spraying of blood and/or other potentially infectious materials.
5) Mouth pipetting/suctioning of blood or other potentially infectious materials is **prohibited**.

6) Needles or other contaminated sharps must not be bent, broken or recapped unless there is no alternative. *If necessary, such recapping or needle removal must be accomplished through the use of a mechanical device or a one-handed technique.*

2.9.3.2 When Performing First Aid

1) Wear disposable latex gloves (or other comparable hypoallergenic alternative) and other appropriate personal protective equipment.
2) Use a microscreen if CPR must be performed.
3) After first aid procedure is completed, remove gloves using care not to touch the contaminated portions with ungloved hands.
4) After removing gloves and other appropriate PPE, wash hands with soap and water.
5) Discard gloves and contaminated materials in a **properly** labeled or red biohazard bag.
6) Decontaminate any equipment and non-disposable PPE that may be contaminated.

2.9.3.3 Shipping Potentially Contaminated Equipment

1) Any equipment to be shipped for servicing that could be contaminated with blood or other potentially infectious materials must be decontaminated if possible before shipment. If the equipment is not decontaminated before shipment or servicing, an appropriate warning label must be attached and all affected employees, servicing representatives, etc. must be informed of the precautions to be taken.

2.9 Exposure Control Procedures - Continued

2.9.3 Work Practice Controls - Continued

2.9.3.4 Clean-Up of Areas Contaminated with Blood and/or Other Potentially Infectious Materials:

1) Latex (or other comparable hypoallergenic alternative) or nitrile utility gloves are to be worn. (*Disposable gloves may be worn UNDER the heavier utility gloves*.)
2) Safety glasses with side shields are to be worn if splattering or splashing could occur.
3) Excess material needs to be wiped up with **disposable** towels and disposed of in a properly labeled or red biohazard bag.
4) Broken glass or sharp objects are to be picked up using a dustpan or piece of cardboard and placed in an approved sharps container.
5) Clean the contaminated area with soap and water and then decontaminate using an effective disinfecting solution such as:
   Chemical germicides approved for hospital use;
   EPA-approved tuberculocidal disinfectants registered by the EPA.
6) All reusable items, such as mops, utility gloves and other PPE, etc., must be decontaminated or discarded.
7) All disposable materials must be discarded appropriately.
8) Blood/Body Fluid response kits will be provided in each work area and on all buses. At a minimum, they must contain the following:
   Disposable latex gloves (or hypoallergenic alternative) (minimum - two pair)
   Disposable paper towels

Sanitary absorbent material (optional)
Plastic bags with twist seals (minimum - one)
Liquid soap packet or alcohol towelettes
Gauze pads (minimum - five)
Band-aids – Assorted Sizes

2.9.4 Housekeeping

1) Written schedules are to be established by the site administrator or designee for cleaning and decontaminating work areas and equipment and are to be included in the Site Specific Section.
2) The site administrator or designee will establish procedures for cleaning and decontaminating work areas and equipment. These are to be included in the Site Specific Section.
3) All work surfaces are to be decontaminated upon completion of medical/first aid procedures, after contamination or at the end of each shift.
4) Protective surface coverings are to be removed and replaced after contamination.
5) Employees must not open, empty or **manually** clean reusable sharps containers.
6) Contaminated broken glassware is only to be picked up by mechanical means, **never** by hand and disposed of in an approved sharps disposal container.

2.9 Exposure Control Procedures - Continued

2.9.5 Standard Operating Procedures

Standard Operating Procedures (SOPs) for activities with the potential for occupational exposure will be included in the Site Specific Section.

1) SOP for the Laboratory
2) SOP for Occupational and Technical Education
3) SOP for Athletics and Physical Education
4) SOP for Exceptional Education Classrooms, Day Care and Early Childhood
5) SOP for the School Health Office

Only those SOPs applicable to the location must be included.

2.10 Exposure Incidents

The following procedures are to be established to ensure that an exposure incident involving a School Board of Brevard County employee is handled properly and effectively.

An exposure incident is any specific eye, mouth, other mucous membrane, non-intact skin, or Parenteral (punctures, bites, needle sticks, etc.) contact with blood and/or other potentially infectious materials that *results from the performance of an employee's duties.*

2.10.1 If an exposure accident/incident occurs:

1) Wash the affected area with disinfectant soap and water **immediately**.
2) If potentially infectious material is splashed in the eyes or mouth, flush thoroughly using the nearest eyewash facility or available water source.

3) Report an exposure incident to a supervisor **immediately**.
4) Document the following:
   - Date and time of the exposure;
   - Where the exposure occurred;
   - What potentially infectious material was involved;
   - Route of exposure;
   - Source of potentially infectious material;
   - Circumstances under which the exposure occurred;
   - Identification of the source individual unless prohibited by law;
   - Any failure of engineering or work practice controls;
   - Corrective actions recommended to avoid future exposure incidents.
5) Immediately refer the employee to the Principal or Facility Manager or their designee to coordinate medical treatment, if necessary.
6) If medical treatment is necessary, give the healthcare provider evaluating the employee after an exposure incident:
   - A copy of *OSHA 1910.1030 Bloodborne Pathogens Standard,* if requested;
   - A description of the exposed employee's duties relating to the exposure incident;
   - Documentation of the route(s) of exposure and the circumstances under which the exposure occurred;
   - Results of the source individual's test(s), if available;
   - Employee's vaccination status and any other relevant medical records.
7) Ensure the employee is provided with an immediate and confidential medical evaluation and follow-up after an exposure incident.
8) The evaluating healthcare provider's written opinion must be obtained and a copy provided to the employee within 15 days of the completion of the evaluation.
9)

2.10.2 Guidelines for Incidents of Student Exposure

When a student or students are involved in a blood/body fluid incident during a school/or school related activity, the following procedures must be followed:

1) Administer first aid to all wounds and exposed areas.
2) Complete a student accident report and maintain in the student's health record.
3) Notify the parent or guardian and advise that they consult with their private physician regarding any further medical care that may be needed.
4) Send a notification to the parent or guardian.

2.11 Recording of Injuries and Illnesses

Whether or not an exposure incident is a recordable injury or illness should be determined by the Principal or Facility Manager or their designee after appropriate consultation with the attending healthcare provider and a review of the *Florida Public Sector Recordkeeping Guidelines*. If it is determined that the injury or illness is recordable, an entry must be made on the SAF 200 Form.

2.12 Biohazardous Waste

2.12.1 General

- Latex (or comparable hypoallergenic) gloves must be worn when handling biohazardous waste.

2.12 Biohazardous Waste - Continued

2.12.1 General - Continued

- Non-sharp objects (i.e. cotton gauze, tape, gloves, paper towels, etc.) contaminated with blood and/or other potentially infectious materials are to be placed in an impervious bag that is tagged or labeled with the biohazard-warning label or otherwise properly identified.
- Bags containing biohazardous materials must be placed in a biohazard box, properly labeled and stored for pickup.

Labels must include:

- √ Identification of the School Board of Brevard County Facility, School or Department;
- √ Site address;
- √ Date waste was generated;
- √ Biomedical hazard symbol;
- √ The words: *Biomedical Waste* or other similar identification.

If tags or labels are not used, other equally effecti ve means of identification, such as "red bagging" must be used.

2.12.2 Sharps

- Sharp objects that are contaminated with blood and/or other potentially infectious materials must be placed in an approved sharps container.
- Containers must be sealed and dated.
- A **BIOHAZARD** label must be affixed to the container.
- Containers must be replaced when filled to less than ¾ capacity.

2.12.3 Storage

- Wastes are to be stored in an area where contact with workers or the public is limited. The storage area must be restricted and designated by a sign with the biohazard symbol (see the Site Specific Section for storage location).
- The storage area surfaces must be smooth, cleanable and impervious to liquids.
- Sharps containers must be separated from other biohazardous waste.
- Biohazardous waste must not be mixed with other hazardous waste.
- A licensed biomedical waste transporter must pick up waste within 30 days.
- Contaminated laundry must be sealed in leak-proof and properly labeled color-coded bags or containers; and is **never** to be rinsed or sorted at the location of use.

2.13 Recordkeeping

Records must be maintained and kept confidential as indicated below. Information regarding the locations of where records are maintained and the name of the person who is responsible for their maintenance is to be listed in the Site Specific Section.

2.13.1 Medical Records

1) A medical file for each employee with potential occupational exposure to blood and/or other potentially infectious materials must be maintained and include the following:
   - √ Employee Name;
   - √ Social Security Number;
   - √ A copy of the employee's Hepatitis B vaccination status including the *HBV Acceptance or Declination Form*;
   - √ Any medical records relative to the employee's ability to receive the vaccination.
2) A copy of all results of examinations, medical testing and follow-up procedures following a potential exposure incident.
3) A copy of the healthcare professional's written opinion regarding post-exposure evaluation and follow-up, if necessary.
4) A copy of the information provided to the healthcare professional regarding post-exposure evaluation and follow-up, if necessary.

The above records are not to be disclosed or reported to any unauthorized person or agency without the employee's express *written* consent, except as required by OSHA *1910.1030 Bloodborne Pathogens Standard* or by any other applicable law.

2.13.2 Training Records

Records must include the date of the class, name and qualifications of the person(s) conducting the class, name and job title of attendees and program content (i.e. course outline and/or syllabus, *Exposure Control Plan*, audiovisual materials, other written training materials, etc.).

2.13.3 Miscellaneous Records

Receipts, transporter documentation, sterilization and treatment logs, etc. for decontamination or disposal of biohazardous waste must be kept on file.

In addition, red plastic bags, if used, must be qualified and tested by the manufacturer and a document certifying they are approved for biohazardous waste must be obtained and maintained on file.

2.13.4 Records Retention

Record	Maintained By	Retention
Inspections: Engineering Controls	**Principals or Facility Managers or Designee**	**12 months**
Biohazardous Waste Transporter Documentation or Sterilization and Treatment Logs	**Principals or Facility Managers or Designee**	**3 Years + Current**
Medical Records (See 2.13.1)	**Principals or Facility Managers or Designee**	**30 Years After Employment Ends**
Red Bag Certifications	**Principals or Facility Managers or Designee**	**For Period of Use**
Training	**Principals or Facility Managers or Designee**	**3 Years**

Exposure Control Plan Site Specific Information

In order to ensure that all the requirements of OSHA's Bloodborne Pathogens Standard, 29 CFR 1910.1030 have been met, the following information must be provided and maintained with this Plan. In addition, a copy should be forwarded to the Environmental Health and Safety Department.

Part 2.3.2 - The *Exposure Control Program Coordinator* for this location is:

Name	Job Classification

Part 2.4 Exposure Determinations

The following employees, Job Classifications and Tasks/Procedures have been determined to have potential exposure to blood and/or other potentially infectious body fluids at this location:

EMPLOYEE NAME (Optional)	JOB CLASSIFICATION	TASK/PROCEDURE

Exposure Control Plan Site Specific Information

Part 2.9.4 - Exposure Control Procedures - Housekeeping

The following materials will be used for decontamination at this facility:

_____ _____

_____ _____

_____ _____

The following decontamination and inspection schedules will be followed at this facility:

AREA/EQUIPMENT	INSPECTION SCHEDULE	DECONTAMINATION SCHEDULE	RESPONSIBILITY

Part 2.9.5 - Exposure Control Procedures – Standard Operating Procedures (SOPs) for the areas indicated below have been developed to provide specific guidance for those performing tasks, not otherwise covered in this Plan, that may expose them to blood or other potentially infectious body fluids:

Laboratory
Occupational and Technical Education
Athletics and Physical Education
Exceptional Education Classrooms, Day Care and Early Childhood
School Health Office

Exposure Control Plan Site Specific Information

Part 2.12.3 - Biohazardous Waste Storage

The following area(s) will be used for the storage of biohazardous waste at this facility:

_____ _____

This area must meet the requirements as shown in Part 2.12 of this Section.

Part 2.13 - Recordkeeping

The following designated personnel will be responsible for maintaining the records required by this Part at this facility:

Primary Name or Job Classification	Alternate Name or Job Classification

Section 3: Chemical Safety

3.1 Introduction

In order to provide for the safety of employees who may be exposed to hazardous chemicals, safe work procedures for chemical use as well as an overall **Hazard Communication Program** has been developed by the School Board of Brevard County.

In order to ensure their safety, employees are to follow the recommendations in this Safety Plan as well as those found on the Material Safety Data Sheets (MSDS) for every chemical used during the performance of their work.

29 CFR 1910.1200 **Florida Statute Chapter 235.3215**

3.2 General

Please refer to the following Sections of this Plan for specific information regarding the handling of flammable/combustible chemicals; compressed gases, compressed gas cylinders, and hazardous wastes:

- √ Compressed Gas and Cylinders
- √ Fire Safety and Prevention
- √ Hazardous Waste
- √ Welding Safety

3.3 Hazard Communication Program

3.3.1 General

3.3.1.1 Policy

The purpose of this Section is to formalize the School Board of Brevard County's intention to comply fully with all governmental rules and regulations pertaining to *OSHA 29 CFR 1910.1200, the Hazard Communication Standard.* All employees are required to comply with the rules, regulations and procedures developed and derived from this rule.

3.3.1.2 General Requirements

This Program will ensure that all employees are informed of the hazardous properties of chemicals with which they must work, safe handling procedures and measures to take in order to protect themselves from the potential hazards associated with these chemicals.

3.3 Hazard Communication Program – Continued

3.3.1 General - Continued

3.3.1.2 General Requirements – Continued

In order to ensure compliance with OSHA 29 CFR 1910.1200, the following are included:

- A Hazardous Materials Inventory and Chemical List (See the Site Specific Section)
- Labeling Procedures
- Training Requirements
- Material Safety Data Sheet (MSDS) Procedures
- Non-Routine Tasks, Safe Work Precautions
- Contractor Responsibilities

3.3.1.3 Scope

This Program applies to all School Board of Brevard County employees as well as contractor personnel and official visitors under certain circumstances. *It applies to all work operations where employees may be exposed to hazardous substances under normal working conditions.*

3.3.1.4 Program Review

A Hazard Communication (HazCom) coordinator (See the Site Specific Section) will be designated and assigned overall responsibility for reviewing and updating this Program **annually**, or more frequently if necessary.

Copies of this written Program will be made available to all employees, their designated representatives, the Assistant Secretary for Occupational Safety and Health, and the Director of the National Institute for Occupational Safety and Health, upon request. Employees may obtain a copy by submitting a request to their immediate supervisor.

A copy of this Hazard Communication Program is to be located in the office of each employment supervisor. This program and other referenced documents can be accessed on the Internet at www.brevard.k12.fl.us and is to be available to employees at all times during business hours.

3.3.2 Hazard Evaluation

Each chemical in this facility is to be evaluated for its potential to cause harm. Either adverse health effects or its potential to pose physical hazards are to be considered.

3.3.2.1 the following are examples of potential hazards to be evaluated:

Health hazards, such as:

- **Toxins** - poison, may be lethal.
- **Irritants** - cause minor injuries to skin, eyes, etc.
- **Sensitizers** - can cause allergic reactions after repeated exposures.
- **Corrosives** - destroy living tissue.
- **Neurotoxins** - affect the nervous system.
- **Hepatotoxins** - affect the liver.
- **Mutagens** - may alter genetic material in living cells.
- **Teratogens** - may cause fetal malformations.
- **Carcinogens** - many cause cancer.

Physical hazards, such as:

- **Fire** (flammables/combustibles).
- **Explosion.**
- **Compressed Gases.**
- **Organic Peroxides.**
- **Oxidizers** - support combustion.
- **Pyrophorics** - may self-ignite.
- **Reactivity** - may undergo chemical reaction with a release of energy.

3.3.2.2 the following guidelines, documents and resources are to be used:

Chemicals that are listed in one of the following sources are to be considered hazardous in all cases:

1) *29 CFR 1910, Subpart Z, Toxic and Hazardous Substances* (OSHA)
2) *Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment* (ACGIH)
3) *School Board of Brevard County: Hazardous Materials, Waste Management and Pollution Control Plan.*

In addition, chemicals evaluated and found to be a suspect or confirmed carcinogen in the following sources are considered hazardous:

1) *International Agency for Research on Cancer* (IARC)
2) *National Toxicology Program (NTP) Annual Report on Carcinogens*

3.3.2.2 The following guidelines, documents and resources are to be used -Continued:

Material Safety Data Sheets

Material Safety Data Sheets (MSDS) will be obtained from vendors for all chemicals obtained by the School Board of Brevard County. These documents contain a listing

of the chemical hazards as determined by manufacturer or importer evaluations and are an important part of the hazard determination process.

3.3.3 Material Safety Data Sheets and the Hazardous Materials Inventory List

3.3.3.1 Hazardous Materials Inventory List

- A "Hazardous Materials Inventory" list of all potentially hazardous materials used by designated areas will be maintained by each site and correspond with the site's chemical list. All potentially hazardous materials must be labeled with the chemical name, trade name or identification number, so workers can associate potentially hazardous materials with appropriate Material Safety Data Sheets (MSDS)

- The "Hazardous Material Inventory" list shall be updated and a valid MSDS shall be included in the area notebook before new potentially hazardous materials are released to the area for use. The MSDS master file is filed with the Warehousing and Distribution Department in their entirety, and are readily accessible to all employees.

- The HazCom Coordinator is responsible for ensuring that this list is maintained and updated as necessary.

3.3.3.2 Material Safety Data Sheets (MSDS)

- Material Safety Data Sheets (MSDS) provide information about the chemicals used by School Board of Brevard County employees in the performance of their work. A typical MSDS will include information about the potential physical and health hazards, first aid procedures; spill response, personal protective equipment recommendations, etc.

3.3 Hazard Communication Program – Continued

3.3.3 Material Safety Data Sheets and the Hazardous Materials Inventory List - Continued

3.3.3.2 Material Safety Data Sheets (MSDS) - Continued

Obtaining Material Safety Data Sheets

- The normal request, collection and transmission of MSDS within the School Board of Brevard County, Florida should occur in the following manner:

1) The area requesting a potentially hazardous material (PHM) fills out a purchase order and notifies the Office of Environmental Health and Safety of the request.

2) Purchasing approves the purchase order for PHM(s). The following clause is affixed or sent along with the purchase order request sent to the chemical manufacturer:

"Pursuant to Chapter 84.223, Florida Statutes, suppliers will act in full compliance and provide with every shipment a Material Safety Data Sheet from the manufacturer of any product or compound substance, composed of or containing 1% or more of any toxic ingredient as compiled in the Florida Toxic Substance List. Failure to comply with this requirement is a violation of Florida Statutes and could result in the School District refusing delivery of the product(s)."

3) Each site requesting the material receives a copy of the MSDS, for the School/Department file and sends a copy to the Office of Environmental Health and Safety.

4) The requesting area logs in the School/Department file and notifies employees of the addition.

Periodically, the HazCom Coordinator will ensure that all MSDS are received and up to date by:

- √ Routine inspections of chemicals in use.
- √ Interviews with employees.
- √ Annual review of MSDS.

3.3.3.3 Retention

- Material Safety Data Sheets must be retained on file for 30 years after the chemical is no longer used.

3.3 Hazard Communication Program – Continued

3.3.3 Material Safety Data Sheets and the Hazardous Materials Inventory List - Continued

3.3.3.4 Availability

- Copies of Material Safety Data Sheets are located:
  - √ At each permanent work site.
  - √ At the School Board of Brevard County Warehouse and Distribution Department.
  - √ At the office of Environmental Health and Safety.

- MSDS are accessible at **all times during all work shifts.**

Training regarding where MSDS are located and how to interpret the information (i.e. known hazards, etc.) is to be provided during Hazard Communication Training.

3.3.4 Labels

All hazardous chemicals in the workplace must be properly labeled.

3.3.4.1 Labels must:

1) List the chemical identity.
2) List the appropriate hazard warnings.
3) List the name and address of the manufacturer, importer, or responsible party.
4) Be legible and written in English.
5) Not be removed or defaced.

***Not required for labels applied by employees to secondary containers into which a chemical has been transferred.**

3.3.4.2 EXCEPTIONS to the Labeling Requirement:

1) Several stationary containers with similar contents and hazards may have warning signs posted to convey the required hazard information.

2) Portable containers into which chemicals are transferred from a labeled container and intended for the immediate use of the employee who made the transfer, need not be labeled if kept under the employee's control at all times.

IMPORTANT! Any container with a chemical that has been transferred from a labeled container must be properly labeled if *not emptied by the end of the shift.*

3.3.4.3 Labeling Systems

There are several labeling systems available to identify chemicals and their hazards. Letters, colors, or pictures may indicate the hazards. The following are examples of the labeling systems that may be used by the School Board of Brevard County:

3.3.4.3.1 Hazardous Material Identification Guide (HMIS) System

A) Uses numbers to indicate degree of hazard with 4 = the most severe and 0 = the least:

- **0** - Minimal Hazard
- **1** - Slight Hazard
- **2** - Moderate Hazard
- **3** - Serious Hazard
- **4** - Severe Hazard

B) Uses colors to indicate the type of hazard:

- **Blue** = Health Hazard
- **Red** = Flammability Hazard
- **Yellow** = Reactivity Hazard

C) Uses letters to indicate the type of personal protective equipment (PPE) recommended. (See HMIS PPE Codes on following Page)

3.3 Hazard Communication Program – Continued

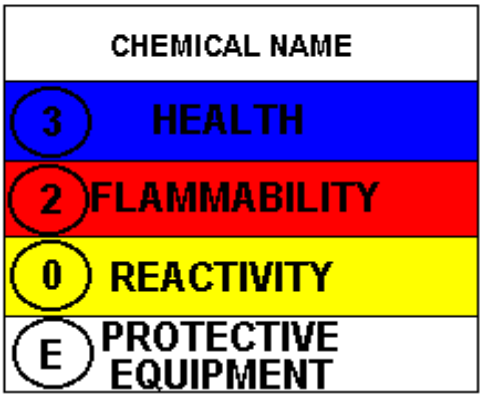
3.3.4 Labels - Continued

3.3.4.3 Labeling Systems - Continued

3.3.4.3.1 Hazardous Material Identification Guide (HMIS) System - Continued

EXAMPLE OF HMIS LABEL

HMIS LABEL



HMIS PPE Codes

PPE GUIDE	
A	[SG]
B	[SG] [G]
C	[SG] [G] [SA]
D	[FS] [G] [SA]
E	[SG] [G] [DR]
F	[SG] [G] [SA] [DR]
G	[SG] [G] [VR]
H	[SpG] [G] [SA] [VR]
I	[SG] [G] [DVR]
J	[SpG] [G] [SA] [DVR]
K	[AL&H] [G] [FuS] [B]
X	OBTAIN SPECIFIC INSTRUCTIONS.

SAFETY GLASSES [SG]
SPLASH GOGGLES [SpG]
FACE SHIELD [FS]
AIR LINE & HOOD/MASK [AL&H]
GLOVES [G]
SYNTHETIC APRON [SA]
BOOTS [B]
FULL SUIT [FuS]
DUST RESPIRATOR [DR]
VAPOR RESPIRATOR [VR]
DUST & VAPOR RESPIRATOR [DVR]

3.3.4.3.2 National Fire Protection Association (NFPA) Labeling System

A) Uses numbers to indicate degree of hazard with 4 = the most severe and 0 = the least:

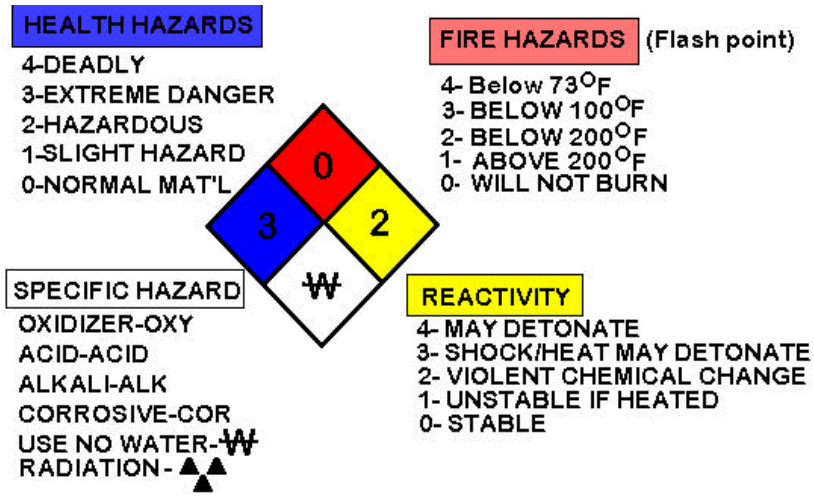
- **0** - Minimal Hazard
- **1** - Slight Hazard
- **2** - Moderate Hazard
- **3** - Serious Hazard
- **4** - Severe Hazard

B) Uses colors to indicate the type of hazard:

- **Blue** = Health Hazard
- **Red** = Flammability Hazard
- **Yellow** = Reactivity Hazard

C) Lists specific hazards in the white portion of the diamond.

EXAMPLE OF NFPA LABEL



3.3 Hazard Communication Program

3.3.5 Signs and Warning Tags

In areas where flammable materials are stored, (paint storage area, etc.), signs are to be posted to warn against “Smoking” or “Open Flames”. Various warning signs and tags are to be used throughout the facility to indicate the hazards of chemicals where necessary in accordance with this Plan.

3.3.6 Non-Routine Tasks

3.3.6.1 ***Non-routine tasks involving chemical use may include:***

Accidental Spills or Discharges.

Safe work precautions and Standard Operating Procedures (SOPs) will be established to ensure that the above tasks are conducted safely.

3.3.6.2 ***The following Sections of the Safety and Health Plan contain information regarding safe work practices to be followed when performing these non-routine tasks:***

- √ Emergency Response
- √ Personal Protective Equipment (PPE)
- √ Fire Safety and Prevention
- √ Respiratory Protection
- √ Hazardous Waste

3.3.7 *Training*

3.3.7.1 ***Training Requirements***

Everyone who works with or is potentially exposed to hazardous chemicals will receive initial Hazard Communication training prior to working with the chemical. If new hazards are introduced into the workplace or processes change, additional training will be required.

3.3.7.2 ***The training agenda is to include the following:***

1) Summary of *OSHA 29 CFR 1910.1200* and this written program.
2) Chemical and physical properties of hazardous materials (e.g., flash point, reactivity, appearance, odor) and methods to detect the presence or release of chemicals.
3) Physical hazards of chemicals (e.g., potential for fire, explosion, etc.)
4) Health hazards, including signs and symptoms of exposure.
5) Procedures to protect against hazards (PPE, engineering controls, safe work precautions).
6) Work procedures to follow to assure protection when responding to or cleaning up hazardous chemical spills and leaks. **(See Emergency Response Plan and Emergency Procedures)**
7) Material Safety Data Sheet training: Where they are located, how to read and interpret the information and when they are available.
8) How to read and interpret the information provided on labels.
9) How to obtain information regarding the hazards of chemicals in the workplace.

3.3.7.3 ***The most current training records are to be kept on file in the employee Supervisor's office. Each record must include:***

Agenda.
Attendance Sheet with Attendee Signatures.
Name of Instructor.
Date of Class.

3.3.8 Contractors

3.3.8.1 Providing Hazard Information to Contractors

A contractor liaison will advise outside contractors in person of the following during a pre-job meeting or discussion before work begins:

- Any owner generated chemical hazards that may be encountered in the normal course of their work on the company's premises;
- The labeling systems in use;
- The protective measures to be taken;
- The safe handling procedures to be used;
- Who can provide additional information;
- The location and availability of Material Safety Data Sheets (MSDS).

3.3.8.2 Contractors Providing Hazard Information to The School Board of Brevard County

Conversely, the contractor shall be instructed by the contractor liaison to provide the same information to the contractor liaison prior to commencement of any work to be performed on School Board of Brevard County property, when the contractor will or might be generating or presenting chemical hazards.

3.3.8.3 Contractors using toxic substances generating noxious odors, fumes, vapors, smoke or excessive dust in construction, repair or maintenance of public school facilities.

Before any toxic substance is used that could generate noxious odors, fumes, vapors, smoke or excessive dust, the contractor must notify the Certified industrial hygienist in writing at least three working days prior to using the substance.

The notification must contain:

- The name of the substance to be used;
- Where the substance is to be used;
- When the substance is to be used;
- A copy of a material safety data sheet (MSDS) for each substance to be used;
- Specifics about site conditions that may generate noxious odors, fumes, vapors, smoke or excessive dust.

The Certified industrial hygienist must take all reasonable actions to ensure that the contractor complies with the safety precautions and handling instructions as shown in the MSDS sheets so that the usage of the substances poses no threat to the health and safe to students, school personnel and the general public.

The Certified industrial hygienist has the authority to deny the proposed use of toxic substances.

3.3.9 Safety Equipment

3.3.9.1 Personal Protective Equipment (PPE)

When engineering and administrative controls are not sufficient to remove or protect employees from chemical hazards, appropriate personal protective equipment (PPE) must be worn. The level of PPE worn will be determined by the recommendations of the MSDS, the level of potential exposure, and the District Certified industrial hygienist.

3.3 Hazard Communication Program – Continued

3.3.9 Safety Equipment - Continued

3.3.9.1 Personal Protective Equipment (PPE) - Continued

3.9.1.1 Eye and Face Protection

- ***Safety Glasses*** with side and top shields must be worn as protection against minor potential chemical exposure as well as when handling high-pressure cylinders.
- ***Face shields*** must be worn when hazards exist to the face and eyes such as mixing chemicals or use of any liquids, such as corrosives, that could damage the face or eyes (possible splashing).
- ***Chemical Safety Goggles*** should be worn when necessary to protect the eyes from airborne chemicals such as mists or where splashing is likely.

3.9.1.2 Foot Protection

- ***Rubber Boots or Shoe Covers*** are to be used when working with corrosives and there is a potential for chemical spills or during clean up procedures.

3.9.1.3 Hand Protection

The appropriate gloves are to be worn to protect hands from harmful substances and temperature extremes as well as cuts, lacerations, abrasions, etc. The MSDS, label, chemical manufacturer and glove manufacturer may be consulted to determine the appropriate type of glove for each exposure.

- ***Chemical Resistant Gloves*** are to be used to prevent chemical contact with and absorption of hazardous chemicals into the body. The appropriate glove (see the MSDS sheet) is to be used for each type of chemical. (Examples: nitrile for solvents and paints, butyl rubber or natural rubber for caustics, etc.)

3.9.1.4 Respiratory Protection

- ***Appropriate Respiratory Protection*** will be provided when employees may be exposed to possible toxins, air contaminants that exceed the Permissible Exposure Limit (PEL), or in oxygen deficient atmospheres (less than 19.5%).

All requirements and responsibilities, as prescribed by *ANSI 288.2-1980, Standard Practices for Respiratory Protection* and *OSHA 29 CFR 1910.134*, will be met as shown in the *Respiratory Protection Section* of this Plan.

3.3.9.1 Personal Protective Equipment (PPE) - Continued

3.9.1.5 Protective Clothing

- ***Protective Clothing***, which may include suits, coveralls, coats, boots and aprons will be provided as necessary to provide protection against exposure to the specific hazards that may be encountered during the performance of the employee's duties. (Examples: welding, spray painting or chemical handling.)

3.9.1.6 Personal Protective Equipment (PPE) Training

Employees are to be trained before the initial use of personal protective equipment and as the need for additional training is indicated. A certified record, containing the name of the employee, the date of the class, the instructor's name, the agenda and the specific PPE covered, is to be kept on file.

3.3.9.2 Miscellaneous Safety Equipment

- ***An Eyewash Fountain*** is to be located in close proximity to areas where work with chemicals is conducted in order to provide immediate first aid treatment for chemical splashes involving corrosives and other materials injurious to the eye.
- ***Fire Extinguishers*** are to be located throughout the building to provide protection from rapid-fire exposures and may be used in the event of a clothing fire.

3.3.10 Community Notification

Principals, Facility Managers or their designees will provide the fire department and Local Emergency Response Commission (LERC) with the following:

1) A list of work areas, identified by name and location, where hazardous substances are present.
2) An MSDS, if requested.
3) An updated lists if changes occur.

3.4 Specific Chemical Information

The MSDS MUST BE reviewed for each chemical before it is used and all recommended safety precautions followed.

3.5 Reproductive and Embryo-Fetus Protection and Carcinogens

3.5.1 Definitions:

Embryo-Fetal Toxin - Substance that can cause detrimental or delayed development of the embryo or fetus but does not cause structural and/or functional abnormalities of development.
Reproductive Hazards - A substance that can cause adverse effects on the function of the reproductive organs (male or female) and interferes with the ability to have offspring.
Teratogens - Chemical substance or physical agent that can cause abnormalities in structural and/or functional development during gestation, in the absence of significant maternal toxicity.
Carcinogen - Any substance capable of causing cancer in humans.

3.5 Reproductive and Embryo-Fetus Protection and Carcinogens - Continued

3.5.2 Requirements

- Work areas where reproductive hazards, embryo-fetal toxins and/or carcinogens are present will be identified and warnings communicated to affected employees.
- Exposure to such hazards will be controlled by:
  - Engineering Controls
  - Safe Work Practices
  - Personal Protective Equipment
- Information and training regarding the hazardous effects and exposure prevention will be covered during Hazard Communication Training.

3.6 Recordkeeping

3.6.1 Records Retention

Record	Maintained By	Retention
Material Safety Data Sheets (MSDS)	√ **At each permanent work site.** √ **At the School Board of Brevar County Warehouse and Distribution Department.** √ **At the office of Environmenta Health and Safety.**	**Duration of Use + 30 Years**
Training Records	**The Employee's Supervisor**	**30 Years after the Employee Leaves Employment***

***Each employee's supervisor shall maintain current training records. As soon as training records become non-current (replaced by new, the employee retires, etc.) the Supervisor shall send the historical record(s) to the School Board of Brevard County Office of Human Resources/Labor Relations for inclusion in the employee's Personnel file.**

Hazard Communication Program - Site Specific Information

Part 3.3.1.4 Hazard Communication (HazCom) Coordinator

The HazCom Coordinator for this facility is as follows:

_____ _____

Name (Optional) **Job Classification**

Part 3.3.3.1 Hazardous Materials Inventory List

The following chemicals are found at this location: _____

Facility Name and/or Number

HAZARDOUS MATERIALS INVENTORY LIST			
TRADE NAME	**CHEMICAL NAME (S)**	**IDENTIFICATION NUMBER (OPTIONAL)**	**MSDS ON HAND?**

Section 4: Compressed Gases

4.1 Introduction

This Section contains guidelines and requirements for the safe use of flammable and/or compressed gases. It covers the use of high-pressure gas cylinders and compressed air.

29 CFR 1910.106 **29 CFR 1910.101**

4.2 Hazards

All gases are to be used in a manner that will not endanger personnel or property in routine shop use or experimental operations. Hazards associated with handling and use of flammable and/or high-pressure gases include the following:

- Injuries caused by flying objects accelerated by an explosion or pressure;
- Almost certain death if a flammable mixture is inhaled and then ignited;
- Asphyxiation;
- Release of toxic gases;
- Secondary accidents such as falls or electrical shocks;
- Fire caused by ignition of flammable gases.

4.3 Flammable Gases

4.3.1 Guidelines

All personnel authorized to work with flammable gases must be familiar with the hazards and emergency measures that might be required in the event of an accident.

For safe operations using flammable gases, use the following guidelines:

- Only personnel authorized to work on the operation are allowed in the operations area.
- Appropriate warning devices and signs must be posted on or near the work area and at the doors to the area.
  Example: **"NO SMOKING or OPEN FLAMES"**
- Use good housekeeping practices - keep unnecessary combustible material out of flammable gas operating areas.
- Only the flammable gas cylinders actually required for the operation are allowed in the area.
- When two or more cylinders containing flammable gas are used inside a room or other confined area, regulators must be modified so the relief valves vent outside the building.
- All ignition sources, e.g., welding torches, lit cigarettes, electric arcs, electrostatic charges, and pilot lights, must be kept away from flammable gases at all times.
- Ventilation must be provided to prevent entrapment of flammable gases in closed areas. *If the gas is lighter than air, overhead ventilation is required*.
- Gases denser than air must be prevented from entering trenches and manholes where they can collect and form explosive mixtures with air.
- **Never use a flame to detect flammable gas leaks**! Use soapy water or proper monitoring equipment.

4.4 Compressed Gases - Cylinders

4.4.1 General

- Only cylinders meeting Department of Transportation (DOT) regulations may be used for transporting compressed gases.
- Each cylinder must bear the required DOT label for the compressed gas contained, except under certain specified conditions set forth in DOT regulations.
- Do not deface, cover or remove any markings, labels, decals, or tags applied or attached to the cylinder by the supplier.
- Each cylinder in use by the District must carry a legible label or stencil identifying the contents
- All cylinders are to be transported vertically and secured.
- Leaking cylinders cannot be transported either by District vehicles or by common or contract carrier.
- All compressed gas cylinders, hoses, tubing, and manifolds must be **inspected at least monthly** to ensure that they are free of defects that could cause a failure.

- Cylinders must be considered defective and rejected (or removed from service) if a valve is stiff, a fitting leaks or if they contain:
  - Dents;
  - Cuts or gouges;
  - Digs over 3 inches long;
  - Leaks (of any size);
  - Fire damage; or
  - Valve damage
- All defective cylinders must be sent back to the vendor for testing and repair.
- Hoses and fittings that appear worn must be replaced before the equipment is put to further use.
- Check to ensure that cylinders are clearly labeled, if not return to the vendor.
- Supervisors are to make monthly surveys of regulators in their areas. *Damaged, unreliable or otherwise defective regulators must be replaced immediately*.

A damaged cylinder can cause severe injuries, including lung damage from inhalation of toxic contents and physical trauma from explosion. A pressurized gas cylinder can become a dangerous projectile if its valve is broken off.

4.4.3 Cylinder Safe Handling Procedures

Experienced and properly trained personnel should handle compressed gases; they are dangerous when handled incorrectly.

- Always assume that a cylinder is pressurized.
- Handle it carefully. Never throw, bang, tilt, drag, slide, roll, or drop a cylinder from a truck bed or other raised surface.

4.4 Compressed Gases - Cylinders - Continued

4.4.3 Cylinder Safe Handling Procedures - Continued

- Lift a cylinder manually only if absolutely necessary and always use two people.
- Use an approved cylinder handcart to move a cylinder.
- Fasten cylinders in metal cradles or skid boxes before they are raised with cranes, forklifts, or hoists.
- Never use rope or chain lifting slings alone to lift cylinders.
- Never use cylinders, even empty ones, as rollers for moving materials, work supports, etc.

4.4.4 Working with Gas Cylinders

- Keep the cylinder valve closed when not in use.
- Ensure that the safety cap is in place.
- Never lift cylinders by their caps.
- Never subject compressed gas cylinders to a temperature above 125^{o}F.
- During welding operations, keep flames, sparks, molten metal, or slag from contacting any part of a compressed gas cylinder, pressure apparatus, hoses, etc.
- Never place cylinders where they might become part of an electrical circuit.
- Ensure that cylinders used in conjunction with electric welding cannot be accidentally grounded and burned by the electric welding arc.

- Protect cylinders from artificially low temperatures. *The loss of ductility and thermal stress at low temperatures may cause a steel cylinder to rupture.*
- Always identify the contents of a gas cylinder before using it.
- Never lubricate threads, fittings, or oxygen regulator components, or allow any **non-approved lubricant** to come in contact with oxygen regulators. To do so may cause an immediate fire/explosion when pressurized.
- Before using a cylinder, ensure it is supported with two metal chains or the equivalent to prevent it from falling.
- Pressure-regulating and relief devices must be used when gas is admitted to systems having pressure limitations lower than the cylinder pressure.
- Traps or check valves should be installed to prevent contamination of cylinders by feedback.
- Gas cylinder valves can be "cracked" (opened slightly) momentarily before regulators are attached to blow dirt off the valve seats. (Point valve outlets away from people or equipment.)
- **DO NOT** "crack" Hydrogen cylinders - friction or static charges could cause it to ignite!
- Always fully release the pressure-adjusting screw of the regulator before opening the cylinder valve.
- Open gas cylinder high-pressure valves slowly; this gives compression heat time to dissipate and prevents "bumping" the gauges.
- Never use a wrench on any cylinder-valve hand wheel.
- Keep removable keys or handles on valve spindles while cylinders are in service.
- Never leave pressure in a system not being used.
- To shut down a system, close the cylinder valve and vent the pressure from the entire system.
- Equipment must not be disassembled while it is under pressure.
- Be aware that valved-off portions of a system may still be under pressure -- bleed the hose, line or vessel before disassembly.
- Connections to piping, regulators, and other appliances should be kept tight to prevent leakage.
- Hoses are to be kept in good condition.
- Manifold pigtails should not be left disconnected for more than a few minutes. *Certain insects are attracted to pure gases and will quickly clog these lines.*
- Never use compressed gas to dust off clothing; this could cause serious injury or create a fire hazard.
- About 30 psig should be left in "empty" cylinders to prevent air from entering the cylinder and contaminating it; air **contamination in a hydrogen cylinder is extremely dangerous**.
- Before a regulator is removed from a cylinder, close the cylinder valve and release all pressure from the regulator.
- Before returning an empty cylinder, close the valve and replace the cylinder-valve protective cap and outlet cap or plug, if used. **(Mark the cylinder EMPTY)**

4.4.5 Cylinder Storage

- Cylinders not actively in use inside of buildings must be stored in approved areas and fastened with two metal chains or bars or in a fixture to prevent them from falling if bumped or shaken.
- If not chained or secured, cylinders must not be left in the upright position.
- Cylinders with different type gases are to be stored separately in accordance with the gases contained.
- Flammable gases must not be stored near oxygen. *High-pressure oxygen cylinders stored inside a building must be separated from flammable gas cylinders by at least 20 feet or by a fire-resistant partition.*
- Storage rooms or areas are to be dry, cool, well ventilated, and where practical, fire-resistant.
- Storage rooms must have solid, level floors or surfaces and be away from traffic.
- Cylinders must not be stored at temperatures above 125^{o}F, or near heat, sparking devices, salt or corrosive materials.
- If stored outside, cylinders must be protected from continuous direct sunlight, extreme weather, or moisture.

4.5 Compressed Air

- Compressed air for shop use must be restricted to **30-psig maximum** pressures by restricting nozzles.
- Compressed air up to 100 psig may be used to operate pneumatic tools, certain control instruments, and equipment with properly designed over-pressure relief devices.
- Building compressed air may be used to clean and to help dry parts and to help accomplish other jobs *if no one is in line with the air and goggles or a face shield are worn.*
- Compressed air must not be used for breathing unless it has been especially installed for this purpose.
- Never apply pressure to the body or use compressed air to clean clothing. **Compressed air injected into body openings can be fatal**. *Compressed air used to clean clothing drives particles into the fabric, where they can cause irritation and infections*.
- When an automatic shut-off coupling is not used on air-operated tools, a short metal chain (or its equivalent) should be attached to the hose to prevent it from whipping, in the event it separates from the tool.
- When using air-operated tools, shut off the compressed air and vent the hose before changing nozzles or fittings.

4.6 Specific Compressed Gases

4.6.1 Oxygen

Oxygen supports combustion, but is itself nonflammable. Oxygen lowers the ignition point (in air) of flammable substances and causes them to burn more vigorously. Materials such as oil and grease burn with nearly explosive violence in oxygen, even in minute quantities.

Use the following precautions when handling oxygen gases.

- √ Never handle oxygen cylinders with greasy or oily hands or gloves.
- √ Do not store near highly combustible materials such as oil, grease, or reserve acetylene.
- √ Never use oxygen to purge lines, operate pneumatic tools, or dust clothing. **Cloth, plastics, etc., saturated with oxygen can burn explosively.**
- √ Insects in oxygen "pigtails" can ignite spontaneously and may cause sufficient heat and over-pressure to burst the pigtail, valve or manifold. *Don't leave pigtails disconnected for more than a few minutes*.
- √ Do not use white lead, oil, grease, or any other non-approved joint compound for sealing oxygen systems fittings. Threaded connections must be sealed with joint compounds or Teflon tape *approved for oxygen service*.
- √ Gaskets must be made of non-combustible materials.

4.6.2 Acetylene

Acetylene gas is colorless and highly flammable with a distinctive garlic-like odor. Acetylene, in its free state under pressure, may decompose violently - the higher the pressure, the smaller the initial force required to cause an explosion**.**

Use the following precautions when working with acetylene:

- √ To prevent flashbacks, check valves are required in welding gas lines and at the welding/cutting torch. If the acetylene pressure drops, the oxygen pressure at the torch can push oxygen back up the acetylene line, where it can mix with acetylene and cause a flashback
- √ NEVER use free acetylene outside the cylinder at pressures over 15 psig - it can decompose violently.
- √ Acetylene cylinders should be stored in an upright position to avoid acetone leaking from the cylinder. *If an acetylene cylinder has been stored horizontally, the cylinder should be put upright and left in that position for at least 30 minutes before being used.*
- √ When cylinders are empty of acetylene, valves must be closed to prevent evaporation of the acetone.

4.6.3 Other

In addition to the above compressed gases, cylinders containing argon, nitrogen and propane are used throughout the School Board of Brevard County. These cylinders must be handled according the requirements as shown above and as recommended by the Material Safety Data Sheets.

In addition:

Propane

- Is a flammable and must be stored away from heat, sparks and open flames.
- Use with adequate ventilation at all times.

Argon and Nitrogen

- Are non-flammable, non-reactive, inert gases? The primary hazard is oxygen displacement, which can cause asphyxiation.
- Use in well-ventilated area.

4.7 Recordkeeping

4.7.1 Records Retention

Record	Maintained By	Retention
Inspections*	**Principals or Facility Managers**	**12 months**

**See Monthly Inspection Report*

Section 5: Confined Spaces

5.1 Introduction

At this time School Board of Brevard County employees do not enter Permit-required Confined Spaces for any reason. Any work is contracted out to companies who provide qualified and trained employees to complete such activities. It is Important, however, that School
Board Supervisors ensure that these contractors read the following Section and abide by its contents.

29 CFR 1910.146

5.2 Hazard Identification

- A thorough hazard assessment for each permit space must be conducted and all hazards and potential hazards identified and safe work procedures established. (See the *Forms Section* for a *Confined Space Assessment Form*.)

- **ALL** employees are to be informed of the existence, location and dangers of the spaces identified, using signs or other means of identification.

If the hazards within a Confined Space can be "eliminated", the space may be reclassified using the Non-Permit Confined Space Reclassification Certification Form *found in the* Forms Section *of this Plan.*

5.3 Training

- Training will be provided for entrants, attendants, entry supervisors and all employees involved with confined space entry. Included in the training will be responsibilities and duties as they are listed in this written program as well as hazard recognition and specific training for equipment use.
- Employees are required to have understanding, knowledge, and the skills necessary for safe performance of their duties.
- Training will be provided:
  - before first assignment;
  - when there are changes in assignments;
  - If there are "new" hazards identified; or
  - there is a program deficiency indicated by deviations from procedures or lack of employee knowledge.

5.4 Written Permit

5.4.1 General

An entry permit must be completed prior to permit-required confined space entry. This permit is a summary of the information required by this program and contains all required safety procedures, equipment requirements and testing/monitoring results necessary to perform the work safely.

- *The Permit Identifies*:
  - √ Permit space(s) to be entered
  - √ Purpose of entry
  - √ Date and authorized duration of entry permit
  - √ Authorized entrant(s) and Attendants
  - √ Entry supervisors, by printed name and signature
  - √ Hazards of the permit space
  - √ Measures required to control hazards of the space
  - √ Acceptable entry conditions
  - √ Test results with signature or initials of tester(s)
  - √ Rescue services, and means to summon them
  - √ Communication procedures and equipment
  - √ All special equipment and procedures, including PPE and rescue equipment
  - √ Any other information needed to ensure safe entry.
  - √ Any additional permits needed.

The permit is to be posted at the job site and verified by the Entry Supervisor. A sample permit can be found in the *Forms Section* of this Plan.

5.5 Rescue Services

The District may elect to use an on-site rescue team, an off-site rescue team or a combination of the two. The type of rescue team to be used is determined before each entry operation and indicated on the permit.

Stand-by rescue is required for all immediately dangerous to life or health (IDLH) atmospheres, or in those that could quickly become IDLH or if "circumstances or hazards" dictate a need for immediate response. For other entries, a response time of 10-15 minutes may be adequate.

5.5.1 Non-entry Rescue

Each authorized entrant must use a full body or chest harness with attachment points that provide a small enough profile for retrieval from the space. Wristlets may be used if the chest or full body harness is shown to be infeasible. The other end of the retrieval line is to be attached to a mechanical device or fixed point outside the permit space. *A mechanical device MUST be used to retrieve personnel from vertical type permit spaces more than 5 feet deep.*

5.5 Rescue Services - Continued

5.5.2 Entry - Rescue

If required, rescue operations will be performed by the local fire department, by a trained on-site team or a combination, as determined before each entry operation. The designated rescue team(s) must be familiar with the facility and the hazards associated with the Permit-Required Confined Spaces to be entered. A copy of this Program, as well as the necessary MSDS(s) with chemical hazard information will be provided to the team. Before any confined space entry operation is started, the designated rescue team will be notified and placed on standby for the duration of the operation. The attendant must be familiar with this Procedure and trained to respond. Necessary rescue equipment is to be coordinated with the designated rescue team before entry begins.

5.5.3 General Requirements - Rescue Teams

The District must evaluate off-site rescue services to ensure that they are adequately trained and possess the type equipment necessary to make an efficient rescue without harming entrants.

- *ON-SITE RESCUE TEAM:*

    1) Must be properly trained in entry procedures, rescue procedures and PPE requirements;
    2) Must practice rescues at least annually from similarly configured spaces;
    3) Must be trained in basic first-aid and CPR, and have at least one member currently certified.

- *OFF-SITE RESCUE TEAM:*

    1) Must meet the same requirements as an on-site team as shown above; and
    2) Must be informed of hazards they may confront;
    3) Rescue services must be provided with access to all permit spaces so they can develop appropriate rescue plans and practice rescue operations;
    4) A copy of the Confined Space Hazard Assessment is to be provided prior to initiation of rescue standby status.

If an injured entrant is exposed to a substance with a required MSDS or similar document, it must be made available to the medical facility treating the entrant.

5.6 Alternate Entry Procedures

5.6.1 Accepted Use

May be used instead of the Permit-Required Entry if the following conditions are met:

- It can be demonstrated that the only hazard posed by the permit space is an actual or potential hazardous atmosphere; AND
- It can be demonstrated that continuous forced air ventilation alone is sufficient to maintain a safe permit space; AND
- The employer has monitored and inspected the confined space and can provide documentation that verifies that Permissible Exposure Limits (PELs) are not exceeded; AND
- All monitoring data is readily available to entrants; AND
- Initial entry necessary to obtain data is performed in accordance with the requirements of the standard.

5.6.2 Alternate Entry Procedures

1) Any conditions making it unsafe to remove an entrance cover are to be eliminated before removal.
2) When entrance covers are removed, the opening is to be promptly and effectively guarded.
3) Before entry, internal atmosphere is to be tested with a calibrated direct-reading instrument, for the following conditions in given order:

    Oxygen Content (19.5%-23.5%)
    Flammable Gases and Vapors (< 10% LFL)
    Toxic Air Contaminants (<PEL)

3) There must be no hazardous atmosphere within the space whenever any employee is inside the space.
4) Continuous forced air ventilation is to be used as follows:
    - Entry is not permitted until the hazardous atmosphere is eliminated;
    - Ventilation needs to be directed to immediate areas where employees will be present and continue until all employees leave the space;
    - Air supply must be from a clean source and not increase hazards.
5) Atmosphere will be periodically tested to ensure that ventilation is adequate.
6) If a hazardous atmosphere is detected during entry:
    - All employees are to leave immediately;

- The space will be evaluated to determine how the atmosphere developed; and
- Measures must be taken to protect employees from hazardous atmospheres before re-entry.

7) A trained department designee will certify in writing that a space is safe for entry and that all requirements have been met. *The certification will be available to each employee before entry.*

5.7 Permit-Required Confined Space Entry Procedures

The following procedures, in conjunction with the written permit, are to be followed before, during and after entry into a Permit-Required Confined Space.

5.7.1 Before Entry

- **To be completed or assigned by the *Entry Supervisor***:

1) Contact and schedule Permit-Required Confined Space entry activities with the designated rescue team. Inform the Authorized Attendant of the procedures to be followed if a rescue situation develops.
2) Ensure that all personnel involved in the entry, (entrants, attendants, etc.) are aware of the dangers identified with the confined space entry, are aware of the physical and behavioral effects of potential exposure and understand the consequences of exposure during a pre-job discussion.
3) Set up barriers or barricades to protect entrants from vehicle traffic and to protect pedestrians from falling into the space.
4) Notify departments likely to have service interruptions.
5) Issue the Confined Space Entry Permit; complete as entry preparation is accomplished.
6) Cap, blind or disconnect all input lines.
7) Lockout and tagout to isolate hazardous energy and materials following Lockout/Tagout Procedures.
8) Clear and ventilate the space of harmful vapors and residue. (Continue ventilation if necessary.)
9) Complete additional permits for other hazardous work as required. (Hot Work, etc.)
10) Identify equipment needs, assemble and set up.
    - Barricades, signs, etc.;
    - Atmospheric testing instruments;
    - Ventilating equipment;
    - Communications equipment (to maintain constant contact with entrants);
    - Personal Protective Equipment (as required);
        Eye protection;
        Head protection;
        Hearing protection;
        Respiratory protection;
    - Lighting (explosion-proof in flammable/combustible atmospheres);
    - Rescue equipment (coordinate with rescue team);
    - Entry and exit equipment (ladders, etc.);
    - Special tools or any other equipment required for safe entry, work and exit.

11) *Testing and Monitoring* - Atmospheric testing and monitoring must be conducted to determine if acceptable entry conditions exist before entry is authorized to begin. (*The space must also be tested and monitored as necessary, to determine that acceptable entry conditions are being* ***maintained*** *during the course of the entry operations.)*
   - Test instruments are to be calibrated and certified to be accurate by a qualified person who is trained in their use;
   - Pre-entry atmospheric testing is to be conducted to ensure that entry conditions meet the following criteria. *Testing should be done in the following order*:

   1st - Oxygen - equals between 19.5% and 23.5%
   2nd - Flammable **or Explosive Gases** - Lower Flammable Limit (LFL) less than 10%
   3rd - Toxic **Gases or Vapors** - less than the established Permissible Exposure Limit (PEL)

All equipment must be inspected and maintained by trained personnel to ensure that it is serviceable and to verify accuracy. ***Equipment is to be provided by the District, at no cost to the employee.***

Testing should be done at different levels in the confined space since some gases and vapors are lighter or heavier than air and may cause higher concentrations at different levels in the space.

12) The **Entry Supervisor** must complete the following before entry is allowed:
   - Verify that the entrants and attendants are trained and qualified;
   - Ensure that potential hazards have been identified, testing has been completed and that the information is available and reviewed before entry;
   - Verify that the rescue crew is alerted and prepared for emergency rescue;
   - Ensure that the means of summoning rescue services is operable and available;
   - Ensure that an **Authorized Attendant** is stationed outside the permit space;
   - Verify that all permits required have been completed;
   - Sign and post entry permit at the site.

5.7 Permit-Required Confined Space Entry Procedures - Continued

5.7.2 During Entry

- ***Testing and Monitoring*** **are to be continued throughout the entry by either:**

1) *Periodic Testing* - After acceptable atmosphere is confirmed for entry, continue testing or monitoring the space to ensure that acceptable entry conditions are being maintained.
2) *Continuous Monitoring* - If the space cannot be isolated, the atmosphere must be tested continuously for the duration of the entry operation in the areas where authorized entrants are working.

If the entrant exits the space for any reason, testing must be repeated before re-entry.

- **An *Authorized Attendant* must be stationed outside the permit space into which entry is authorized *for the duration of entry operations* and assume the following responsibilities**:

  1) Understand the hazards that may be encountered during the entry, recognize symptoms of exposure and understand the consequences of exposure.
  2) Be equipped to summon rescue and other emergency services if needed, and know how to do so.
  3) Know how to use rescue equipment and perform rescue duties that can be done without entering the space.
  4) Keep an accurate count of all persons within the permit space.
  5) Maintain contact with workers within the space. *(Radios if necessary)(Spark resistant if required)*
  6) Monitor activities within and around the permit space to determine if it is safe for workers to remain within the space.
  7) Order the workers to leave the confined space if:
     - Unsafe conditions around or in the space develop;
     - Entrants exhibit symptoms of exposure.
  8) Secure the retrieval line to a mechanical hoist or winch, where practical, or to a brace or railing to prepare for potential rescue.
  9) *Remain outside the Permit-Required Confined Space and* **DOES NOT ENTER,** even to rescue workers, unless relieved of the attendant's duties by another Authorized Attendant.

The attendant may be assigned to monitor more than one permit space provided the duties assigned can be effectively performed for each permit space to be monitored.

5.7 Permit-Required Confined Space Entry Procedures - Continued

5.7.2 During Entry - Continued

- ***The Authorized Entrants* who enter the Permit-Required Confined Space to perform work, must**:

  1) Understand the hazards that may be encountered during the entry, recognize symptoms of exposure and understand the consequences of exposure.
  2) Be familiar with equipment to be used by them during the entry.
  3) Communicate with the Attendant at all times.
  4) Alert the Attendant if warning signs or symptoms of exposure, or a hazardous condition occurs.
  5) Exit the permit space as quickly as possible when ordered or alerted to do so.

- ***The Entry Supervisor must****:*

  1) Note any problems during the entry on permits so revisions to procedures may be made, if necessary.

2) Prevent unauthorized persons from entering the permit space during confined space entry.
3) Assure that if responsibility for a permit space entry is transferred, that operations stay consistent with the requirements of the entry permit.

The Entry Supervisor may also be an Authorized Attendant or Entrant.

5.7.3 Concluding the Entry

- ***The Entry Supervisor* signs off and terminates the permit when:**

  1) Work is satisfactorily completed;
  2) All entrant(s) exit the permit space;
  3) All equipment, barriers, isolation, lockout/Tagout devices, etc., are removed; and/or
  4) The confined space has been rendered inaccessible.

- **It may be necessary to terminate the permit if**:

  1) The permit expires; or
  2) A condition not allowed under the permit arises.

5.8 Recordkeeping

5.8.1 Retention and Review

- Permits are to be kept in an active file for one year and reviewed **annually** to ensure that the program is effective and the certifications current.
- A record of the most current training must be kept on file and include a copy of the agenda, the employee's signature, date of training, and instructor's name.

5.8.2 Records Retention

Record	Maintained By	Retention
Confined Space Analysis	**Environmental Health and Safety**	**Most Current**
Training	**Environmental Health and Safety**	**Most Current**
Entry Permits	**Principals or Facility Managers**	**1 Year**

5.9 Definitions

Acceptable Entry Conditions - the conditions that must exist in a permit space to allow entry and to ensure that employees involved can safely enter and work within the space.
Attendant - the individual stationed outside one or more permit spaces who monitors the Authorized Entrants and who performs all attendants' duties assigned in the department program.
Authorized Entrant - an employee who is authorized by the department to enter a permit space.

Confined Space -

- A space large enough and so configured that an employee can bodily enter and perform work;
- Has limited or restricted means for entry or exit;
- Not designed for continuous employee occupancy.

Engulfment - the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry - the action by which a person passes through an opening into a permit-required confined space. *Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.*

Entry Permit - the written or printed document that is provided by the department to allow and control entry into a permit space and that contains the information necessary and specified by OSHA for safe work procedures.

5.9 Definitions - Continued

Entry Supervisor - the person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by the Standard.

Any Entry Supervisor also may serve as an Attendant and Authorized Entrant, as long as that person is trained and equipped as required by the Standard for each role he/she fills. Also, the duties of Entry Supervisor may be passed from one individual to another during the course of an entry operation.

Hazardous Atmosphere - an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor or mist in excess of 10 % of its lower flammable limit (LFL).
- Airborne combustible dust at a concentration that meets or exceeds its LFL (Approximated as a condition in which the dust obscures vision at a distance of 5 feet or less.)
- Atmospheric oxygen concentration below 19.5 % or above 23.5 %.
- Atmospheric concentration of any substance with an established dose or permissible exposure limit (PEL) that could result in employee exposure in excess of its dose or permissible exposure limit.

An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury or acute illness due to its health effects, is not covered by this Provision.

- Any other atmospheric condition that is immediately dangerous to life or health.

For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with Hazard Communication Standard, 1910.1200 published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

Hot Work Permit - the department's written authorization to perform operations (for example, riveting, cutting, welding, burning, and heating) capable of providing a source of ignition.

Immediately Dangerous to Life or Health (IDLH) - any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

Inerting - the displacement of the atmosphere in a permit space by a noncombustible gas, such as nitrogen, to such an extent that the resulting atmosphere is noncombustible.

Isolation - the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as blanking or blinding; misaligning or removing sections of lines, pipes or ducts; a double block and bleed system; lockout or Tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

Non-Permit Confined Space - a confined space that does not contain, or with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Oxygen Deficient Atmosphere - an atmosphere containing less than 19.5 % oxygen by volume.

Oxygen Enriched Atmosphere - an atmosphere containing more than 23.5 % oxygen by volume.

5.9 Definitions - Continued

Permit-Required Confined Space - a space that has one or more of the following characteristics.

- Contains or has a potential to contain a hazardous atmosphere;
- Contains a material that has the potential for engulfing an Entrant;
- Has an internal configuration such that an Entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- Contains any other recognized serious safety or health hazard.

Prohibited Condition - any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

Rescue Team - the personnel designated to rescue employees from permit spaces.

Retrieval System - the equipment (including retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Testing - the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

Section 6: Contractor Safety

6.1 Introduction

The School Board of Brevard County often employs personnel to perform work in a variety of areas through contract arrangements. These persons are sometimes referred to as temporary, contract or subcontract personnel. Although these employees are not permanent or part-time employees of the District, it is essential that the same safety obligations that apply to payroll employees also apply to those employed as temporary, contract or subcontract personnel.

29 CFR 1910.1200 **Florida Statute Chapter 235.3215**

6.2 Responsibilities

6.2.1 Principals and Facility Managers, or their Designees

- If assigned to direct the work of contractor and/or subcontractor employees, District representatives must ensure that appropriate safety equipment is used and that working conditions are equivalent to those provided payroll employees.

The District's contractors are, in most cases, independent and provide their own direct supervision and conduct their operations independently.

- Before work begins, the District representative must ensure that Contractor's are given information regarding the existence of work-site hazards and precautionary measures that should be taken to avoid injury.

A contractor liaison will advise outside contractors in person of the following during a pre-job meeting or discussion before work begins:

  - Any chemical hazards that may be encountered in the normal course of their work on School Board premises;
  - The labeling systems in use;
  - The protective measures to be taken;
  - The safe handling procedures to be used;
  - Who can provide additional information;
  - The location and availability of Material Safety Data Sheets (MSDS).

- The District representative will review with contractor personnel, the applicable sections of the *School Board of Brevard County's Construction Project Safety* publication and this Safety Plan.
- District representatives must ensure that the Contractor can provide any written programs or procedures that are pertinent to the specific work to be done to ensure compliance with the Occupational Safety and Health Administration (OSHA), as well as School Board of Brevard County policies.
- Must understand all federal, state and local laws that apply to their work activities.
- Must be familiar with the School Board of Brevard County's Safety and Health policies and procedures including the *School Board of Brevard County's Construction Project Safety* procedures publication.
- Contractor supervisors must communicate the above information to their employees and any of their sub-contractors.

- Prior to the start of work, a survey of the work site should be conducted, all applicable safety rules and regulations reviewed and a pre-job discussion with a District representative conducted.
- Contractors must use equipment that meets regulatory requirements and is safe to operate.
- Contractors must become familiar with the hazards that their employees will be exposed to and communicate precautions to them.
- The Contractor must provide personal protective equipment (PPE) to their employees, as necessary.
- Communication with the District's representative must be continuous.
- All of the contractor's written programs that are required by Federal and State agencies must be presented for review before work is started. (i.e.; Confined Space Entry, Lockout/Tagout, etc.
- Work must be performed safely and measures taken to protect the environment.
- Employees who are employed by the Contractor must be trained to perform their assigned work in compliance with State and Federal regulations.

If a Contractor's employees may be exposed to chemical hazards, the Contractor must be provided with the applicable Material Safety Data Sheet (MSDS) and must review them with their employees who may have such exposure.

Except when responding to an emergency, personnel entering the facility must:

1) Identify themselves to the appropriate management personnel upon arrival. If required, identification badges must be worn at all times.
2) Obey the on-the-job instructions, obey all safety and health rules, wear appropriate clothing and protective equipment and follow any special instructions given by District supervision.
3) Report any hazardous conditions to their supervisor, or, if unavailable, to the School Board of Brevard County Representative.

6.3 Contractors using toxic substances in construction, repair or maintenance of public school facilities.

Before any toxic substance is used, the contractor must notify the District Environmental Health and Safety Office in writing at least three working days prior to using the substance.

The notification must contain:

- The name of the substance to be used;
- Where the substance is to be used;
- When the substance is to be used; and
- A copy of a material safety data sheet (MSDS) for each substance to be used.

The District Environmental Health and Safety Office must take all reasonable actions to ensure that the contractor complies with the safety precautions and handling instructions as shown in the MSDS sheets so that the usage of the substances poses no threat to the health and safety of the students, school personnel and the general public.

Section 7 Cranes and Hoists

7.1 Introduction

Overhead cranes, chain hoists and other power hoisting equipment are used throughout School Board of Brevard County facilities. In addition, many departments use boom trucks or mobile cranes. The crane, the operator and the person attaching the load are key components in this process. The crane must be in good operating condition, the operator must be trained and the individual attaching the load must be knowledgeable in rigging and movement of loads. In order to prevent accidents or injuries, the following guidelines are to be followed at all times.

29 CFR 1910.179 29 CFR 1910.180 29 CFR 1910.184 29 CFR 1926.251 29 CFR 1926.550 29 CFR 1910.554

7.2 Responsibilities

7.2.1 Facility Supervisors or their Designees

- Ensure those who operate, maintain, repair, inspect and assemble cranes are competent and trained.
- Provide necessary training.
- Ensure that a crane maintenance and inspection program is established and maintained in a logbook or file.

7.2.2 Crane Operator

- Be familiar with the crane, its functions and limitations.
- Understand the information in the manufacturer's operating manual.
- Be familiar with the crane's load chart.
- Inspect and maintain the crane.
- Record any inspections, maintenance, or work done on the crane in the field.
- Be aware of site conditions and ensure the area is prepared for the crane.
- Understand hazards of power lines and observe safety precautions.
- Determine load, equipment and safe lifting requirements.
- Operate crane in a smooth, controlled and safe manner.
- Shut down and secure the machine properly after use.

7.2.3 Rigging Crew

- Must be experienced and competent.
- Must be capable of determining weights, judging distances, heights and clearances.
- Able to select tackle and lifting gear.
- Know how to rig the load safely and securely.

7.3 Training

- Designated, trained personnel may only conduct Crane operations.
- Training is to include:
  - How to operate the equipment safely.
  - How to inspect the equipment, including lifting devices.
  - How to position, rig and move loads safely.
  - How to inspect slings for damage and defects.
  - Specific equipment operation.

- Training is to be conducted before work is done and if new equipment is added or observations indicate a need for retraining.

7.4 Inspections (All Cranes including Boom Trucks)

In order to ensure that cranes and rigging equipment are in good operating condition, periodic inspections are to be conducted as follows:

7.4.1 All Cranes and Lifting Fixtures

- ***Daily*** *(On days used - Visual):*

  1) All functional operating or control mechanisms for maladjustment, excessive wear, and/or contamination.
  2) All electrical apparatus for malfunctioning, excessive wear, and/or contamination.
  3) Deterioration or leakage in lines, tanks, valves, drain pumps, and/or other parts of air or hydraulic systems.
  4) Hooks, for deformation or cracks.
  5) All safety devices for any potential malfunction.
  6) Hoist chains, wire ropes, slings, and connections.
- ***Monthly*** *(Certification record with date, inspector's signature and serial number or identification number of the crane must be kept on file):*

  1) Hooks, for deformation or cracks.
  2) Hoist chains, including end connections.
  3) Running ropes - check for worn outside wires, corroded or broken wires or improperly applied end connections, kinking, crushing, cutting or unstranding.
  4) Hoist chains, wire ropes, slings and connections.
  5) Excessively worn or damaged tires.
  6) All items as shown in the *Daily* inspection.
- ***Annually*** *(Complete crane inspection - keep certification record on file)*

  All items on the Daily and Monthly inspections, as shown above, as well as the following:

  1) Deformed, cracked or corroded members (crane structure & boom).
  2) Loose bolts or rivets.
  3) Cracked or worn sheaves and drums.

4) Worn, cracked or distorted parts, such as pins, bearings, shafts, gears, rollers, and locking and clamping devices.
5) Excessive wear on brake system parts.
6) Load, wind, boom angle, and other indicators over full range.
7) Power plants for improper performance, if applicable.
8) Electrical apparatus for signs of pitting or deterioration.

- ***Other***

1) Magnetic particle or any other suitable crack detecting inspection must be performed on crane hooks and lifting fixtures at least once every four years.
2) A crane, which has been idle for a period of at least six months, is to be given a complete inspection, as shown above.

In addition to the periodic inspections, cranes must be tested before being initially put into service, after major repairs, or after any design modification.

7.5 Preparation: Before the Lift

It is essential that the individual attaching the load know how to determine the weight of the load and the center of gravity, how to select the appropriate lifting devices, and how to control the load.

7.5.1 before the lift, an operational test needs to be conducted including a test of:

- The controls.
- The upper and lower hoist limit switches, if applicable.

7.5.2 Lifting Equipment

- Never load the lifting device beyond its rated load, except for test purposes.

The rated load of the crane is to be plainly marked on each side of the crane. If the crane has more than one hoisting unit, each one must have its rated load marked on it or its load block, and this marking must be clearly legible from the ground or floor.

7.5 Preparation: Before the Lift - Continued

7.5.3 Determining the Weight of the Load

- *Weights may be determined by:*

√ Documents such as Bills of Lading, specification sheets, drawings, etc.
√ Information on the load itself, such as nameplates and shipping tags.
√ The load may be weighed on scales.
√ The load may be calculated using dimensions such as length, width, height and the unit weight.

7.5.4 Center of Gravity

A load must be stable before it is lifted. A stable load is one in which the center of gravity is directly below the main hook and below the lowest attachment point(s). ***The "center of gravity" is the point at which a load will balance regardless of the shape of the load.***

7.5.5 Selecting the Rigging Equipment

- Know the rated capacities of the slings and lifting hardware.
- Make sure you select the hitch and slings that will support and control the load.
- Select the correct type of sling for the job.
- Inspect all rigging equipment selected before using.

A properly trained person is to inspect slings and all fastenings and attachments for damage or defects before each shift's use.

7.5.6 Preparing the Load for Lifting

- Never wrap the hoist chain or wire rope around the load or allow it to drag under the load, if applicable.
- Make sure the load or sling is properly seated in the saddle of the hook. NEVER ALLOW THE LATCH HOOK TO SUPPORT ANY PART OF THE LOAD.
- Ensure that the chains or wire rope are seated properly in the wheels or sprockets, if applicable.
- Make sure the load attachment is above the center of gravity.
- Ensure that sling legs are not kinked.
- If a basket hitch is used, the load must be balanced to prevent slippage.
- Make sure the sling is securely attached to the load.
- Pad or protect slings from the sharp edges of a load.
- Hands or fingers are not to be placed between the sling and its load while the sling is being tightened around the load.
- Do not pull a sling from under a load when the load is resting on it.
- On wire rope hoists, do not load hoist with less than two wraps of rope on the drum, unless a lower limit device is provided, in which case no less than one wrap should remain on the drum.
- Center the unit over the load before lifting. AVOID SIDE PULL.
- Allow for the additional sling load on the leg due to the angle.
- When a load is to be crane-lifted by slings from a crane hook through two, three or four single-load pickup points located at the corners of the load, and without the use of a spreader bar, the forces at the lift points need to be non-vertical. In this case a single bolt pickup device, such as a safety hoist ring or equivalent carefully designed and maintained in-house device, is to be used at each pick-up point.

7.6 Lifting the Load

7.6.1 General Safe Operating Practices

- Attach tag guide line(s) prior to lifting the load.
- Keep personnel clear of lift area.
- Lift the load a few inches to check balance and rigging.
- Use proper hand signals if necessary.
- Start and stop slowly.
- Maintain control of the load at all times.
- Suspended loads need to be kept clear of all obstructions.
- All employees must be kept clear of loads to be lifted and of suspended loads.
- Loads must not pass over personnel.

The load path must be selected and controlled to eliminate the possibility of injury to employees should the material handling equipment fail.

- If work is performed on equipment while it is suspended by material handling equipment, a back-up system capable of supporting the entire load must be used in order to provide support in the event the mechanical handling equipment fails.
- A suspended load needs to be lowered to the working surface and the material handling equipment secured **before leaving the load unattended**.
- Cranes are not to be used to drag loads sideways.

Always lift slowly and carefully.

7.7 Slings

7.7.1 Alloy Steel Chain Slings

- √ Must have permanently affixed identification tags stating size, grade, rated capacity and reach.
- √ Are not to be used to lift loads that exceed the rated capacity.
- √ Are to be used according to the manufacturer's instructions.
- √ Removed from service permanently if heated above 1000^{o}F.
- √ Do not use worn or damaged alloy steel chain until repaired.
- √ Remove chains with cracked, worn, or deformed master links, coupling links or other components from service.

7.7.2 Wire Rope Slings

- √ Not to be used in excess of the rated capacity.
- √ Removed from service if exposed to temperatures greater than 200^{o}F.
- √ Removed from service if any of the following conditions are present:
  - Ten randomly distributed broken wires in one rope lay.
  - Five broken wires in one strand in one rope lay.
  - Wear or scraping of 1/3 the original diameter of outside individual wires.
  - Kinking, crushing, bird caging or any other damage.
  - Evidence of heat damage.

- Worn deformed or cracked end attachments.
- Hooks that have been opened more than 15% of the normal throat opening.
- Corrosion of rope or end attachments.

7.7.3 Synthetic Web Slings

- √ Ensure that slings are marked or coded to show the rated capacities for each type of hitch and type of synthetic web material.
- √ Never use slings to lift loads greater than the rated capacities.
- √ Do not use nylon web slings where fumes, vapors, sprays, mists, or liquids of acids or other corrosives are present.
- √ Do not use polyester and polypropylene web slings where fumes, vapors, sprays, mists, or liquids of caustics are present.
- √ Do not use web slings with aluminum fittings where fumes, vapors, sprays, mists, or liquids of caustics are present.
- √ Do not use synthetic web slings at temperatures in excess of 180^{o}F.
- √ Do not use polypropylene slings at temperatures in excess of 200^{o}F.
- √ Synthetic web slings are only to be repaired by a sling manufacturer or other authorized facility.
- √ Remove from service if any of the following are present:
  - Acid or caustic burns
  - Melting or charring of the sling surface
  - Snags, punctures, tears, or cuts
  - Broken or worn stitches
  - Distorted fittings

Remove damaged or defective slings from service immediately!

7.8 Boom Trucks

In order to operate a crane mounted on a boom truck, the following safe work precautions, in addition to those listed above, must to be adhered to:

7.8.1 General

- The boom truck Operator's Manual and Service Manual must be kept available for reference.
- The load chart must be maintained in the cab of the boom truck.
- The crane's log recording all prior inspections, tests, repairs, maintenance, modifications and deficiencies is to be kept up-to-date.
- Never allow a crane boom to hit or touch any structure.

7.8.2 Crane's Principle of Leverage

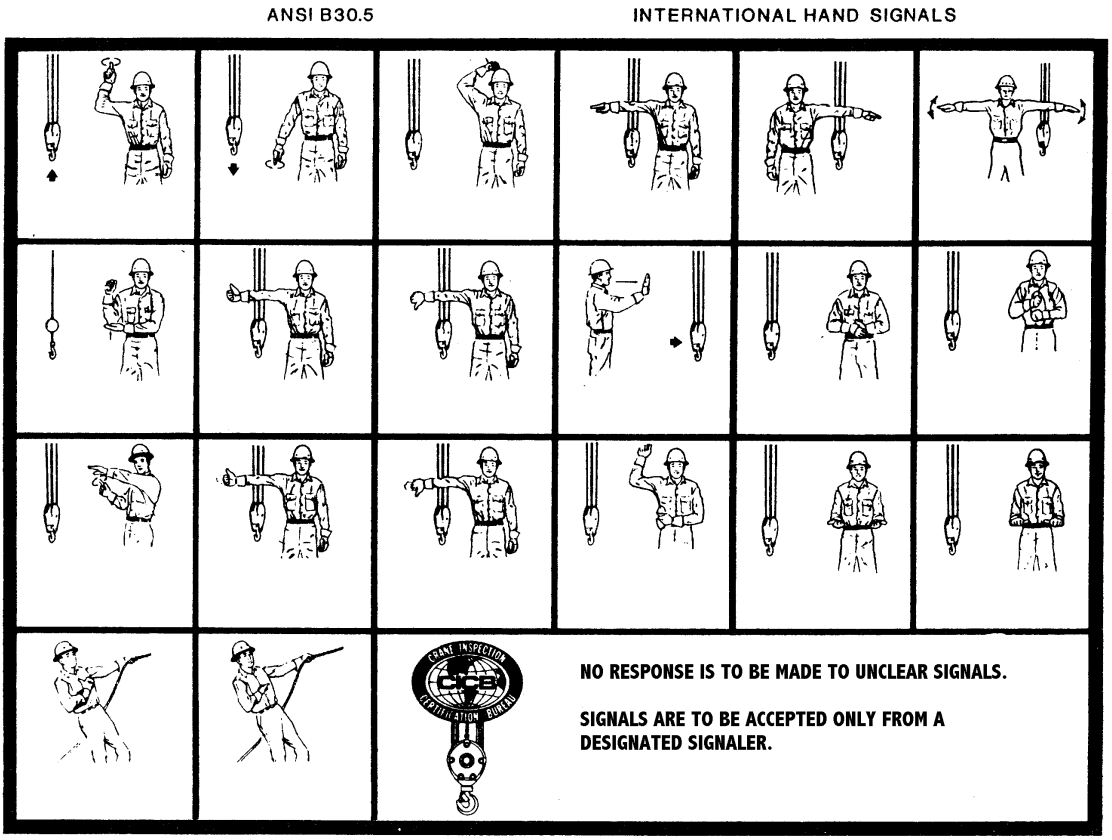
- Mobile cranes use the "principle of leverage" to lift loads.
- The crane's leverage must be greater than the load's leverage.
- NEVER EXCEED THE CRANE'S LIFT CAPACITY.
- Overloading a crane by any of the following can cause tipping or structural failure:
  - Lifting a load in excess of the rated load.
  - Booming down and increasing the load radius.
  - Telescoping out and increasing the load radius.

7.8.3 Site Preparation

- Operations are to be conducted far enough from shoring, excavations, trenches, etc. to eliminate risk of collapse.
- Public access to the lift area must be prohibited and barricades made available.
- Ropes or barricades are to be positioned to prevent entry into hazard areas near and behind the crane.

7.8.4 Signalers

- Are to be used whenever the operator cannot see the load, the landing area or the path of travel, or are close to power lines.



7.8.5 When In Transit

- The boom must be carried in line with the direction of motion.
- Empty hooks must be restrained.

7.8.6 When Leaving a Crane Unattended

- Lower load to the ground.
- Place controls in neutral.
- Disconnect the master clutch or shut down the engine.
- Set brakes and locking devices.

7.8.7 Fire Extinguishers

- A fire extinguisher must be kept in the cab of the boom truck or in the immediate vicinity.

7.8.8 Overhead Lines

Any overhead wire is to be considered an energized line unless and until the person owning the line or the electrical utility authorities indicate that it is not energized and it has been grounded and marked appropriately.

- Before setting up, the operator must look for power lines and if present, exercise extreme caution.
- Operations are to be conducted so that minimum clearances from power lines are maintained; if not, power lines must be shut down or relocated by the utility company responsible.
- Procedures need to be established to prevent contact with power lines.
- Power lines with voltage up to 125,000 volts a minimum of 10 feet distance in any direction. Power lines with voltage between 125,000 volts to 250,000 volts a minimum of 15 feet distance in any direction. Power lines with voltage over 250,000 volts a minimum of 20 feet distance in any direction
- Keep all personnel away from the crane when it is near power lines. Do not allow anyone standing on the ground to touch the crane, the load or the hook.
- Avoid using tag lines.
- In the event of contact:
  - Remain in the cab. DO NOT PANIC!
  - Instruct all other personnel to keep away from the machine, ropes and load. *All of these, including the ground around the machine, may be HOT.*
  - Move the crane away, if possible, or remain in the cab until the utility company responds.

7.9 All Crane Repairs (Including Boom Trucks)

- Routine maintenance, adjustments and repairs are to be performed by a qualified repairperson and recorded according to each machine's established schedule and according to OSHA requirements.

7.10 Recordkeeping

7.10.1 Records

- Maintenance and service logs and inspection records must be certified and retained for five years and include:
  - Date of the inspection, maintenance and/or service
  - Signature of inspector and/or repair person
  - Serial number or identifier of the crane

7.10.2 Retention

Record	Maintained By	Retention
Inspection Records (Monthly and Annual)	**Supervisors**	**5 Years**
Maintenance and Service Logs	**Supervisors**	**5 Years**
Training	**Supervisors Responsibility**	**Most Current/Kept on site by supervisor and EHS office.**

Section 8: Electrical Safety

8.1 Introduction

The School Board of Brevard County will take every reasonable precaution in the performance of work to protect the health and safety of employees and to minimize the probability of damage to property. The electrical safety requirements contained in this Section have been established in order to achieve these goals.

29 CFR 1910.301-336 **29 CFR 1926.400-449**

8.2 Responsibilities

8.2.1 All personnel are responsible for:

- All aspects of electrical safety within their own work groups.
- Maintaining a safe work environment.
- Reporting any hazards to management.
- Working to the current National Electric Code.

8.2.2 Management is responsible for:

- Providing information, instruction, and assistance, as appropriate, concerning electrical safety requirements and procedures.
- Taking corrective action on any potentially hazardous operation or condition.

8.3 Designs and Work Environment

8.3.1 General

- Equipment must be designed and constructed to provide employees protection. *First-line and backup safeguards are to be provided to prevent employees' access to energized circuits.*
- Periodic tests must be established to verify that these protective systems are operative.

All systems performing safety functions or controlling a potentially hazardous operation must be periodically validated by actual test procedures at least once a year and both the procedures and actual tests documented.

8.4 Training

Training, at the appropriate level, must be provided to all employees who may be exposed to electrical hazards before hazardous work is assigned and repeated as necessary. Information is presented through classroom instruction, written materials and on-the-job training.

8.4.1 Unqualified personnel - Employees who face a higher than normal risk of electrical exposure will be identified and receive the following training:

1) Safety-related work practices related to their jobs.
2) Inherent hazards of electricity including:
   - High voltage
   - Electric current
   - Arcing
   - Grounding
   - Lack of guarding

8.4.2 Qualified personnel - Employees who work on, near or with exposed energized parts will be identified and receive the following training:

1) All training required for *unqualified personnel*.
2) Skills and techniques necessary to:
   - Distinguish exposed live parts from other parts of electrical equipment;
   - Determine the nominal voltage of exposed live parts, including the use of test equipment;
   - Clearance distances for working in the vicinity of overhead lines; and
   - The use of special precautionary techniques.
3) The use of the following:
   - Personal Protective Equipment (PPE);
   - Insulating and shielding materials;
   - Insulated tools.

8.5 Work on or Near De-Energized Parts

8.5.1 General

Lockout/Tagout Procedures must be followed when de-energizing, testing and re-energizing equipment.

All electrical parts are required to be de-energized before work is done unless it can be demonstrated that de-energizing introduces additional or increased hazards.

8.6 Working on or Near Energized Equipment

8.6.1 Safe Work Practices

The following safe work practices must be used to protect the employees against contact with energized parts with any part of their body or through some other conductive object.

1) Insulated tools or handling equipment are required.
2) Fuse handling equipment must be used to remove or install fuses in energized terminals.
3) Protective shields, barriers or insulating materials are required to be used when working near energized parts.
4) Use alerting techniques, such as signs, tags barricades and attendants, to warn or protect employees from electrical hazards.
5) Illumination is required to perform work safely.
6) Conductive materials/equipment are prohibited in areas where they can contact exposed energized parts.
7) No conductive articles of clothing or jewelry are to be worn unless insulated from contacting exposed energized parts.
8) Only portable ladders with non-conductive side rails are to be used.
9) When working in a confined space, protective shields, protective barriers or insulating materials are to be used.

Equipment that is de-energized but not locked and/or tagged out is considered energized.

Only *Qualified persons* are allowed to work on, near, or with energized electrical parts.

8.7 Test Equipment

8.7.1 General

- Test instruments, including cables, are to be visually inspected before each use.
- Check test instruments for proper rating and application to the environment.
- Do not use test equipment where flammable materials are present on a temporary basis.
- Test equipment for circuits over 600 volts nominal are to be checked immediately before and immediately after the test for proper operation.

Testing work on electric circuits or equipment is limited to a qualified employee.

8.8 Cord/Plug Connected Equipment

8.8.1 Safe Work Practices

The following safe work practices are to be followed for use of cord and plug connected equipment, including flexible cord sets and extension cords:

1) Equipment is to be properly handled to prevent damage.
2) Equipment is to be inspected before use on each shift.
3) Appropriate grounding continuity is required.
4) Equipment must be approved for use in highly conductive work locations if used in such an environment. (Double insulated and grounded.)
5) Proper connecting (plugging/unplugging) procedures are to be used. NEVER YANK A CORD TO DISCONNECT IT and ensure that hands are not wet.
6) A flexible cord used with grounding-type equipment must contain a grounding conductor.
7) Locking type connectors must be properly secured after connection.
8) Adapters that interrupt the continuity of the equipment grounding connection may not be used.

8.9 Operating Electric Power and Lighting Circuits

8.9.1 Safe Work Practices

The following practices are established for operation of electric power and lighting circuits:

1) Only load-rated devices are to be used to open/close circuits under load.
2) Protective devices such as circuit breakers are to be reset only after it has been determined that they could be operated safely.
3) Over current protection, such as circuit breakers and fuses are not to be modified.

8.10 Personal Protective Equipment (PPE)

8.10.1 General

Personal Protective Equipment (PPE) per current OSHA regulations is to be provided and employees are to be instructed in the proper selection, inspection, maintenance and use of all assigned PPE.

1) *Safety Glasses* - either safety glasses or a face shield must be worn when working on electrical equipment.
2) *Electrical Gloves* - are to be inspected and certified every 6 months. (Outer coverings should be used over gloves where there is a hazard from sharp objects piercing or tearing the electrical gloves.)
3) *Personal Protective Devices* - for work on any energized circuitry, personal protective devices (per current OSHA regulations) are to be used and each job needs to be evaluated for the potential to come into contact with energized electrical conductors.
4) *Hard Hats* - must be worn when performing energized electrical work and must be non-conductive.
5) *Fuse Pullers* - are to be used to remove and replace fuses.

Insulated equipment (PPE) needs to be inspected for damage and discarded if found to be defective.

8.10.2 Testing and Certification

Electrical PPE must be tested and certified at appropriate intervals in accordance with OSHA Table I-6 as shown below.

Table I-6. - Rubber Insulating Equipment Test Intervals	
Type of Equipment	**Testing Intervals**
Rubber insulating line hose	upon indication that insulating value is suspect.
Rubber insulating covers	upon indication that insulating value is suspect
Rubber insulating blankets	before first issue & every 12 months thereafter (1).
Rubber insulating gloves	before first issue & every 6 months thereafter (1).
Rubber insulating sleeves	Before first issue & every 12 months thereafter (1).
If the insulating equipment has been electrically tested but not issued for service, it may not be placed into service unless it has been electrically tested with the previous 12 months.	

8.11 Overhead Lines

8.11.1 General

If work is to be performed near overhead lines:

1) The lines need to be de-energized and grounded or other protective measures must be provided before work is started.
2) If the lines are to be de-energized, arrangements must be made with the person or organization that operates or controls the electric circuits involved to de-energize and ground them.
3) Unqualified persons working from the ground or in an elevated position near overhead lines, must maintain a location such that the longest conductive object he/she may contact cannot come closer to any unguarded, energized overhead line than the following: 40 kV or less – 10 feet and if over 50kV – 10 feet plus 4 inces for every 10kV over 50 kV.
4) Qualified persons working in the vicinity of overhead lines, whether in an elevated position or on the ground, may not approach or take any conductive object without an approved insulated handle closer than shown in *Table S-5* below unless:

   - The person is insulated from the energized part with gloves and sleeves rated for the voltage involved;
   - The energized part is insulated from the person and all other conductive objects at different potential;
   - The person is insulated from all conductive objects at a different potential from that of the energized part.

8.12 Vehicular and Mechanical Equipment

8.12.1 General

- Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines must be operated so that a clearance of 10 feet is maintained.
- If the voltage is higher than 50 kV, then the clearance must be increased 4 inches for every 10 kV over 50 kV.
- The clearance may be reduced if:
  - The vehicle is in transit with its structure lowered (reduce to 4 feet + 10 inches for every 10 kV over 50 kV);
  - Insulating barriers are installed over energized lines;
  - The equipment is in an aerial lift insulated for the voltage involved and a qualified person performs the work. The distance may be reduced to that in *Table S-5*.
- Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments unless:
  - The employee is wearing protective equipment rated for the voltage;
  - The equipment is located so that no non-insulated part can come closer to the line than the permitted clearances.
- If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized lines is intentionally grounded, employees working on the ground near this point may not stand at the grounding location when contact with overhead lines is possible. *Barricades or insulation must be used to protect employees from hazardous ground potentials*.

8.13 Illumination

8.13.1 General

1) Employees may not enter spaces containing exposed energized parts unless illumination is provided.
2) Employees may not reach blindly into areas that may contain energized parts.
3) Emergency lighting is to be provided in areas where power may be cut off.

8.14 Conductive Materials and Equipment

8.14.1 General

- Any materials or equipment that is conductive and in contact with the employee needs to be handled in a manner that will prevent contact with exposed energized conductors or circuit parts.

If an employee must handle long dimensional conductive objects in areas with exposed live parts, THERE MUST BE WORK PRACTICES ESTABLISHED TO MINIMIZE THE HAZARD.

8.15 Housekeeping

8.15.1 General

- Where live parts present an electrical contact hazard, employees may not perform housekeeping duties at such distances to the parts that there is a possibility of contact, unless adequate safeguards, such as insulating equipment or barriers, are provided.
- Electrical conductive cleaning materials (including conductive solids such as steel wool, metallic cloth, silicon carbide, as well as liquid solutions) may not be used in proximity to energized parts unless procedures are followed which will prevent electrical contact.

8.16 Interlocks

8.16.1 General

- Only a *Qualified person* may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system needs to be returned to its operable condition when the work is completed.

See the Lockout/Tagout Section for procedures for compliance.

8.17 Grounding

8.17.1 General

- In order to provide for the safety of employees who are exposed to electrical hazards during the performance of construction work, OSHA has formulated rules and regulations that require either:
    1) Ground Fault Circuit Interrupters (GFCIs), or
    2) A scheduled and recorded Assured Equipment Grounding Conductor Program
- Each location may determine which option it will use. A sample *Assured Equipment Grounding Conductor Program* (Option 2) is included below and may be used along with a specific list of equipment inspected and tested.

8.17.2 Ground Fault Circuit Interrupters (GFCI) (Option 1)

General Requirements

- All 120-volt, single-phase, 15 and 20 ampere receptacle outlets, which are not a part of the permanent wiring of the building or structure and which are used by employees, must have approved Ground Fault Circuit Interrupters (GFCIs) to protect employees.

Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the frame and other grounded surfaces, need not be protected with a GFCI.

8.17.3 Assured Equipment Grounding Conductor Program (Option 2)

8.17.3.1 General Requirements

- A Competent Person must be assigned at each site to implement the provisions of this Program.
- All tests and inspections are to be documented.
- The most current tests and inspections are to be maintained on file.
- Records will be made available at the site to the State of Florida, OSHA or any affected employee.

8.17.3.2 Inspections

- Visual inspections are to be conducted before each day's use.
- The following is to be inspected for damage:
  - Cord sets
  - Cap, plug and receptacle of cord sets
  - Receptacles (not a permanent part of structure)
  - Cord and plug connected equipment.

8.17 Grounding - Continued

8.17.3 Assured Equipment Grounding Conductor Program (Option 2) - Continued

8.17.3.3 Tests

- Are to be conducted:
  - Before first use;
  - After repair and before returning to service;
  - After potentially damaged.
- Tests are to be conducted every 3 months and more often if exposed to damage.
- Test for:
  - Continuity of equipment of grounding conductor;
  - Proper terminal connection of equipment grounding conductor.
- Tests may be conducted using a simple tester such as:
  - A lamp and battery;
  - A bell and battery;
  - An ohmmeter; or
  - A receptacle tester.

8.18 Recordkeeping

8.18.1 Records Retention

Record	Maintained By	Retention
General Maintenance/Inspection Records	**Supervisor**	**12 months**
Training	**Environmental Health and Safety Office**	**Most Current**
Certifications: Electrical PPE	**Supervisor/ Environmental Health and Safety Office**	**3 Years**
Assured Equipment Grounding Conductor Program Tests and Inspections	**Job Site Supervisor**	**Retain at Site for Review by Authorities. Keep on file for duration of project/work.**

Section 9: Elevated Work

Elevated work includes all work on scaffolds, ladders and elevated positions above six feet, including roofing and aerial platforms/lifts. Employees performing such work must adhere to the following information and safe work procedures.

29 CFR 1910.26-30 29 CFR 1910.66-68 29 CFR 1926.104 29 CFR 1926.450-454 29 CFR 1926.500-503 29 CFR 1926.552

9.1 Ladders

9.1.1 General – All Portable Ladders

- Select the right ladder for the job. It must be long enough, in good condition and the correct type for the use intended.
- Always use ladders made of non-conductive materials, such as wood or fiberglass when working near, or on electrical equipment. NEVER COME WITHIN 10 FEET OF ENERGIZED ELECTRICAL EQUIPMENT OR LINES.
- Wooden ladders must be unpainted and free of splinters, cracks and/or shake.
- Use ladders for the purpose for which they are designed. Never use as a brace or skid or in a horizontal position as a platform or runway.
- A ladder must not be loaded beyond its rated capacity or used by more than one person at a time (*see manufacturer's label*).

- Ladders must be inspected before each use, after an accident and monthly by a competent person. Look for loose and/or damaged rungs, steps, rails, braces and missing hardware. *If defects are found,* TAG "OUT OF SERVICE!"
- Damaged ladders must never be used - either repair or destroy.
- Ladders need to be clean and free of oil, grease or other slipping hazards.

9.1.2 Step Ladders and Platform Ladders

- Stepladders must be Class I, industrial grade and not exceed 20 feet in length.
- The height of a stepladder needs to be sufficient to reach the workstation. NEVER climb higher than the second tread from the top.
- Bracing on the back legs of step ladders must not be used for climbing.

9.1 Ladders

9.1.3 Straight and Extension Ladders

- Always select a ladder long enough and strong enough to do the job.
- Single or individual sections of extension ladders are not to exceed 30 feet; extension ladders with two sections are not to exceed 48 feet; and extension ladders with more than two sections are not to exceed 60 feet.
- Extension ladders must have positive stops that will ensure overlap.

9.1.4 Fixed Ladders

Before fabrication or installation of a fixed ladder in any School Board of Brevard County facility, *OSHA 29 CFR 1910.27* MUST be reviewed in order to ensure complete compliance. The following are only a few of the requirements:

- Fixed ladders must be designed to hold at least 200 pounds.
- The rungs on a metal fixed ladder must be at least ¾ inches in diameter and 1 1/8 inches on a wood ladder.
- The distance between rungs must be 12 inches and uniform.
- Rungs must be at least 16 inches between the side rails and free of hazards.
- There must be seven inches clearance in the back of a fixed ladder.
- Cages or wells must be provided on fixed ladders 20 to 30 feet. They must extend at least seven to eight feet above the ladder.
- A landing platform must be provided for each ladder with a cage at each 30-foot height.

9.1 Ladders

9.1.5 Safe Work Procedures – All Ladders

- Ladders are to be ascended or descended facing the ladder with both hands free to grasp the ladder.
- Never move, shift or extend ladders if they are occupied.
- Tools are to be carried in a tool belt or raised with a hand line attached to the top of the ladder.

- Never reach or lean too far to either side while working on a ladder. *Keep your belt buckle between the rails*!
- Workers need to be secured to a TIED OFF ladder or other stationary object for fall protection, if necessary for safety. If the job requires use of both hands, the worker must wear a safety belt or harness and tie up short to the ladder.

9.1.6 Setup - All Portable Ladders

- Make sure the feet of the ladder rest on a **solid, even** surface.
- Do not place in front of doors that open towards the ladder or on boxes, barrels or other unstable bases.
- Ensure that the areas around the top and bottom of the ladder are kept clear.
- If a ladder must be placed in a walkway or aisle, the area must be marked off and secured.

9.1.7 Setup - Step Ladders and Platform Ladders

- Make certain that spreaders are locked into place.

9.1 Ladders - Continued

9.1.8 Setup - Straight and Extension Ladders

- Ladders must be set up against a stable surface using the four-to-one ratio as shown below.
- Extension ladders need to be tied in place to prevent side slip.
- Ladders to roofs **must** extend three feet (approximately three rungs) above the top of the building wall.

9.1.9 Storage

- Store ladders out of the weather, away from excessive heat and supported if stored horizontally.
- Ladders must be stored so that they are easily accessible for inspection and service.

9.2 Scaffolding

Scaffolding used by the School Board of Brevard County is to be constructed of metal and of the tube and coupler or tubular welded frame type. All scaffolds purchased must conform to OSHA Standards

9.2.1 General – All Scaffolding

- Footing or anchorage for scaffolds must be sound and capable of carrying the load without settling or displacement. *NEVER use barrels, boxes, concrete blocks, etc. to support scaffolds or planks.*
- Scaffolds and components must be able to support ***four times*** the maximum intended load.
- Never alter a scaffold and always ensure that it is maintained in a safe condition.
- NEVER move scaffolding while in use or occupied.

- If a scaffold is damaged or if defects are found, TAG "OUT OF SERVICE". Repairs must be made immediately and the scaffold not used until repairs have been completed and a competent person has inspected it.
- A safe means of accessing the working platform level must be provided.
- Employees on scaffolds must be protected from overhead hazards.
- Guardrails (42 + or - 3 inches high), midrails and toeboards (3 ½ inches high) must be installed on all open sides and ends of platforms more than 10 feet above the ground or floor. Additionally, if employees are required to work or pass under the scaffolds, wire mesh is to be installed between the toeboard and guardrail along the entire opening.
- No work is to be done on scaffolds during adverse weather conditions.
- The top rail must be able to withstand 200 pounds pressure; the midrails, screen and mesh must be able to withstand 150 pounds pressure.
- Scaffolding is to be inspected before each use by a competent person and continuously inspected by the employees using it.

9.3 Fall Protection

When workers are required to work from surfaces that are in excess of six feet above an adjacent work place, one of the following fall protection systems must be used:

9.3.1 Guardrails - Consist of a top rail (42 inches + or – 3 inches) above the work surface, with a midrail, screens, mesh and toeboard, etc. (See Section 9.2 Scaffolding)

- Top rail must be able to withstand 200 pounds pressure, and midrails, screens; mesh and all other structural members must be able to withstand 150 pounds pressure.
- When used at holes, guardrails are to be erected on all unprotected sides. If the hole is used for the passage of materials, two sides may be removable or the hole may be covered when not in use.
- When used around holes that are points of access (i.e. ladderways) a gate may be provided.

9.3.2 Personal Fall Protection Systems - Include a body harness, lanyard, lifeline, connector and anchorage point capable of supporting 5000 pounds.

- Inspect personal fall protection components prior to each use and remove from service if defective.
- Anchorage points must be independent of that used for support of the platform and capable of supporting 5000 pounds.
- Personal fall protection systems are NOT to be attached to guardrail systems.
- Personal fall protection systems must be rigged to limit "free fall" to less than six feet or to prevent contact with a lower level.
- The "D" ring or attachment point, needs to be at the center of the back near shoulder level or above the head.
- Per *OSHA Construction 1926.502,* as of January 1, 1998 ONLY *body harnesses with* ***locking*** *snaphooks* may be used for fall protection.
- Fall-arrest systems are not required when work is being done while standing on a ladder, however, the ladder needs to be tied off at the support point.

9.3 Fall Protection

9.3.3 Warning Line Systems - Lines or ropes installed around a safe work area on a roof.

- Warning lines consist of ropes, wires or chains and supporting stanchions that are capable of supporting at least 16 pounds. The height must be between 34 to 39 inches from the work surface, including sag.
- Warning lines must be installed on ALL sides of the roof work area, **not less than six feet from the roof edge.**
- An access path may be formed using two warning lines for access points, materials handling, storage and hoisting areas. When not in use, a barricade equivalent to the warning line must be placed across the path.
- Workers may only perform work within the area inside warning lines.

9.3.4 Safety Monitoring System - A trained person monitors employees performing work on elevated surfaces and warns them of hazards. This system may be used on low-slope roofs less than 50 feet wide, but must be used in conjunction with another method of fall protection otherwise.

- The *Safety Monitor* is a competent person designated by the employer to monitor the safety of other employees.
- **A *Safety Monitor* MUST:**
  - Be able to recognize fall hazards;
  - Warn employees of fall hazards or unsafe actions;
  - Remain on the work surface within sight of workers;
  - Be close enough to orally communicate with workers;
  - Have no other activities or responsibilities that will divert attention from the monitoring function;
  - Have the authority to **STOP** work if fall hazards are observed.
- Mechanical equipment must not be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in roofing operations on low-slope roofs.

9.3 Fall Protection - Continued

9.3.5 Covers - Used for holes in floors, roofs and other walking/working surfaces.

- Covers must be secured and capable of supporting two times the weight that may be imposed upon them at any one time.
- They must be color-coded or marked with the word “HOLD” or “COVER”.

Skylights are considered to be holes and must be guarded.

9.4 Roofing Work

Employees who must perform work on roofs must be protected by fall protection as identified in the previous Section. The type of protection selected is based upon the roof and its characteristics. In all roofing work, the Fall Protection Plan Checklist provided in the Forms Section of this Plan may be used to help ensure the safety of employees.

9.4.1 Fall Protection - Roofing

9.4.1.1 Steep Roofs - Greater than four feet vertical to 12 feet horizontal with unprotected sides and edges six feet above levels, require one of the following fall protection systems:

- √ guardrail system with toeboards
- √ personal fall arrest system

9.4.1.2 Low-Slope Roofs - Less than four feet vertical to 12 feet horizontal with unprotected sides and edges six feet or more above lower levels require one of the following fall protection systems:

- √ guardrail system
- √ personal fall arrest system
- √ combination of warning line system and guardrail system
- √ combination of warning line system and personal fall arrest system
- √ combination of warning line system and safety monitoring system

Low-slope roofs that are less than 50 feet in width may use a safety monitoring system only.

9.4.2 Pre-Job Discussion

- After the appropriate fall protection system is selected, a pre-job conference or discussion with all members of the work crew, supervisors and related contractors should be held prior to the start of the job. The following information should be covered:
  - Sequence of work;
  - Safety practices to be followed;
  - Who may access work area;
  - Responsibilities of employees, supervisors, contractor and the safety monitor.

9.4.3 Responsibilities

9.4.3.1 Management

- √ Identify areas where fall protection is required;
- √ Determine fall protection system to be used;
- √ Obtain or develop fall protection system;
- √ Provide appropriate training.

9.4.3.2 Supervisors

- √ Understand when fall protection is required;
- √ Provide workers with fall protection and ensure that they use it.

9.4.3.3 Employees

- √ Understand and follow all safety procedures and rules that apply to the job;
- √ Bring to the attention of management any unsafe or hazardous conditions immediately;
- √ Attend and participate in required training.

9.4.3.4 Safety Monitor

- √ Attend and participate in required training;
- √ Perform duties as indicated in *9.3.4 Safety Monitoring System*.

Materials or equipment MUST NOT be placed within six feet of the roof edge.
Stacks of materials must be stable.

9.4.4 Fall Protection Plan Checklist

FALL PROTECTION PLAN CHECKLIST
Location of Job_____ Start Date _____End Date _____ **Work to be Done _____** **Prepared by_____ Approved by _____**
Fall Protection System to be Used **1) Low sloped roof (< 4 in 12) (< 50 feet wide)** ‰ safety monitor ‰ guardrail w/toeboards ‰ personal fall arrest ‰ warning line ‰ safety monitor+warning line **2) Low sloped roof (< 4 in 12) (>50 feet wide)** ‰ guardrail w/toeboards ‰ personal fall arrest ‰ warning line ‰ safety monitor+warning line **3) Steep roofs (>4 in 12)** ‰ guardrail w/toeboards ‰ personal fall arrest
If Safety Monitor Used: ***(One (1) Safety Monitor per Six (6) Employees)***
Safety Monitor(s) 1) _____ 2) _____ **Designated Employee(s)**

1)_____ 2)_____ 3)_____ 4)_____ **5)_____ 6)_____ 7)_____ 8)_____** **9)_____ 10)_____ 11)_____ 12)_____** ***Safety Monitor Identification*** **‰ Yellow Hard Hat ‰ Yellow Arm Band ‰ Orange Vest** ***Designated Worker Identification*** **‰ Yellow Hard Hat ‰ Yellow Arm Band ‰ Orange Vest**
‰ Pre-Job Discussion Completed
Training Completed: **‰ Safety Monitor ‰ Roofing Workers**
‰ Fall Protection System in Place Retention: 12 Months

9.5 Aerial Platforms (Lifts)

Aerial platforms (lifts) are devices that have adjustable position platforms, supported from ground level by a structure used to lift materials or employees. They may be powered or manually operated. The School Board of Brevard County uses many types and some are rented or leased for individual jobs.

Operation and use of this equipment may subject workers to hazards, therefore the following rules and procedures must be followed to ensure their safety.

9.5.1 General - Pre-Start Up

- Only **trained**, **qualified and authorized** employees may use this equipment.
- A **qualified person** must have received training in the operation of the equipment, understand the manufacturer's instructions and know the safety rules and regulations.
- A manufacturer's manual must be available and reviewed by the operator and all employees assigned to the job before work begins.
- Aerial platforms must be inspected by users to ensure proper operation. A pre-start inspection needs to include:

  Operation and emergency controls;
  Safety devices;
  Personal protective devices (including fall protection);
  Air, hydraulic and fuel leaks;
  Cables and wiring harness;
  Loose or missing parts;
  Tires and wheels;
  Placards, warnings, and control markings; and
  Guardrail system.

If problems are discovered, repairs must be made before use.

- A **work place inspection** must be conducted prior to use in order to identify potential hazards such as drop-offs, holes, soft soil, slippery surfaces, bumps, obstructions, debris, overhead obstructions, electrical lines or high voltage conductors, inadequate support, wind and adverse weather conditions, and the presence of unauthorized personnel in the area.

9.5.1 General - Pre-Start Up - Continued

If there are overhead power lines or conductors in the area, ensure that a safe distance or clearance is maintained. IF ANY PART OF THE EQUIPMENT CONTACTS ENERGIZED ELECTRICAL LINES, THE RESULTS CAN BE DEADLY.

If it is determined that work must be conducted in a hazardous location, specific precautions must be taken to ensure safe operations.

9.5.2 Start Up

- Always walk around the equipment before start up. Make sure no one is in the area.
- Follow the manufacturer's manual for starting.
- Check all instruments, gauges and indicator lights.

9.5.3 Operations

- Know the capacity of the equipment and never elevate a platform with a load that may exceed it.
- Make sure that the equipment is on a firm, flat, smooth and level surface before the platform is raised.

9.5.3 Operations - Continued

- Never elevate a platform unless all outriggers (if applicable) have been properly set.
- Do not allow anyone to stand or pass under a raised platform.

9.5.4 Workers In or On a Platform

- Workers in an aerial lift **may not** tie off to any adjacent structures.
- Employees must stand firm on the floor of the basket or use ladders, etc. for proper work position.
- Employees are not to sit or climb on the edge of the basket.
- A harness with a lanyard must be worn and attached to the boom or basket when working from an aerial lift.
- Never wear loose clothing or accessories that can be caught in moving parts.
- Secure loose items on the platform to keep them from falling.

9.5.5 Shutdown

- Operators must shut down an aerial platform if there is a malfunction or if any potentially unsafe condition develops. The lift may not be used until the problem is corrected.
- The operator needs to ensure that the area around the platform is clear of personnel and equipment before lowering the platform.
- If the work platform is to be left unattended, lower to the ground, place the controls in neutral, shut off the engine, set the brake and remove the key.
- After the machine is lowered, the employee needs to dismount carefully, keeping hands and feet away from the controls. NEVER JUMP OFF THE MACHINE!

9.6 Forklift Platforms

9.6.1 General

- Forklift platforms must be built to conform with OSHA standards.
- Platforms must be securely attached to the forklift.
- A forklift with a work platform must have an operator at the controls when in use.
- Work platforms are to be equipped with guardrail systems as outlined in the Fall Protection portion of this Section.
- Forklift platforms must not be used within 10 feet of any overhead power line.

9.7 Elevated Work - Training

9.7.1 Employees who use stairways and ladders during the performance of construction work must receive the following training per OSHA 29 CFR 1926.1060:

The nature of hazards in the work area;
Procedures for erecting, maintaining and disassembling fall protection systems;
Proper construction, use, placement and care in handling of stairways and ladders;
Maximum load capacity of ladders;
Content of *29 CFR 1926 Subpart X*.

9.7.2 Employees who perform construction work while on scaffolding must receive the following training per OSHA 29 CFR 1926.454:

Nature of any electrical, fall or falling object hazards in the work area;
Procedures for erecting, maintaining and disassembling fall protection and falling object systems;
Maximum load capacities of scaffolds.

9.7.3 Employees who are involved in erecting, disassembling, moving, operating, repairing, maintaining or inspecting a scaffold during the performance of construction work must receive the following training per OSHA 29 CFR 1926.454:

Nature of scaffold hazards;
Correct procedures for erecting, disassembling, moving, operating, repairing, inspecting and maintaining the type of scaffold in use;

The design criteria, maximum load capacity and intended use of the scaffold.

9.7.4 Employees who are exposed to fall hazards during the performance of construction work must receive the following training per OSHA 29 CFR 1926.503:

The nature of fall hazards in the work area;

Procedures for erecting, maintaining and disassembling fall protection systems;

Use and operation of guardrail systems, personal fall arrest systems, and other protection to be used;

The role of each employee in the safety monitoring system when used;

Correct procedures for handling and storage of equipment and materials and the erection of overhead protection;

The role of employees in fall protection plans.

9.7.5 Employees who operate aerial platforms during the performance of construction work must receive the following training before operating per OSHA 29 CFR 1926.453. The following training must also be provided for those performing work covered by the General Industry standard, OSHA 29 CFR 1910.67:

The purpose and function of controls;

Manufacturer's operating instructions and safety rules;

All warnings, decals and instructions as shown on the aerial platform.

All training must be provided by a competent person as defined by OSHA.

9.7.6 Training Frequency

Training must be completed before work is started and retraining is required if there are:

- Changes in the workplace;
- Changes in the types of fall protection systems or equipment being used;
- Inadequacies demonstrated in employee knowledge or understanding.

Before selecting an employee to work on or in elevated work stations, supervisors must consider the worker's condition, such as medical problems, fear of heights and coordination.

9.8 Recordkeeping

9.8.1 Records

A written certification record of training must be maintained containing:

- Name of employee;
- Signature of person conducting the training;
- Date of training;
- Model of aerial lift on which training was received, if applicable.

9.8.2 Retention

Training records for aerial platforms must be maintained for **three years**. For all other types, the most current training records must be retained.

Record	Maintained By	Retention
Maintenance/Inspection Records	**Plant Operations and Maintenance Supervisors**	**12 months**
Training	**Plant Operations and Maintenance Supervisors**	**Aerial Platforms – 3 Years** **All others - Most Current**
Fall Protection Plan Checklist	**Plant Operations and Maintenance Supervisors**	**12 months**

Section 10: Emergency Procedures

10.1 Introduction

It is important that all employees understand their responsibilities during an emergency situation. This Section includes a general Emergency Procedures Plan, which has been prepared to assist employees in proper evacuation procedures during an emergency as well as general instructions for emergency events that could occur at School Board of Brevard County facilities. The information provided in this Section may be used as a guideline, but the *Brevard Public School's Critical Incidence Manual* should be referenced for more specific procedures. This document may be obtained through the Office of Public Safety.

29 CFR 1910.38 FS Chapter 64E-13.001 *State Requirements for Educational Facilities*

10.2 Emergency Procedures Plan

10.2.1 General Information

10.2.1.1 Purpose

This Plan is designed to provide for a safe and orderly response to an emergency. Employees need to understand their responsibilities, as outlined in this Plan and conduct themselves in a manner that will not only minimize properly damage, but also more importantly, provide protection for themselves, students, co-workers, the community and the environment.

10.2.1.2 Maintenance of the Plan

*The Principal, the Facilities Manager or their designee, must review this Plan at least **annually.** Changes to the Plan must be made as necessary.*

10.2.1.3 Training

All employees are to receive training appropriative to their level of participation in emergency response:

- √ *Initially, during the new employee orientation/training;*
- √ *When the Plan, procedures, equipment, or their roles change;*
- √ *If new hazards are introduced or it is determined to be necessary.*

10.2.1.4 Drills

During the firs two weeks of each school year, two practice drills must be conducted with monthly, unannounced evacuation drills for the remainder of the year. It is recommended that the local fire department participate in a drill at least ***annually****.*

10.2.1.5 Records

Documentation of practice drills and training must be maintained on file.

10.2 Emergency Procedures Plan - Continued

10.2.2 Types of Emergencies

10.2.2.1 Examples of Emergencies

An emergency is an unplanned event that requires an immediate action. The following are examples:

- √ *Potential injury to students or employees;*
- √ *Potential major loss to a building or a facility;*
- √ *Potential hazard to the surrounding community;*
- √ *Natural disasters, such as hurricanes, lightning, floods, wildfires, tornadoes, etc.;*
- √ *An electrical power or other utility failure;*
- √ *Potable water contamination.*

10.2.2.2 Emergency Response Guidelines

Emergency response guidelines for the following are included in this Plan:

- √ *Fatality or injury to an employee or student;*
- √ *Fire or explosion;*
- √ *Releases of hazardous materials and/or chemicals;*
- √ *Weather-related events;*
- √ *Loss of utilities.*

10.2.3 Required On-Site Safety Equipment

Principals and Facility Directors must know the location of safety equipment and ensure that those assigned duties during an emergency are also informed. Equipment should be inspected monthly to ensure that it is operational, in place and accessible.

- **Fire Extinguishers** of the appropriate classification are to be located throughout each facility.
- **First Aid Kits** must be provided and include CPR microscreens and latex (or other acceptable hypoallergenic substitute) gloves.
- ***Personal Protective Equipment (PPE)*** *must be issued to each employee, per the site hazard assessment, with additional equipment located in each employee's work area.*
- ***Safety Showers and/or Eye Wash Stations*** *must be located in areas where corrosives and/or flammable materials are used.*
- ***Emergency Lighting*** *is to be provided in exit aisles and passageways.*
- **Fire Alarm Systems** consisting of a central fire alarm system with smoke/heat detectors that will automatically initiate alarms in schools should be installed where applicable. In addition, pull-stations for manual initiation are to be located throughout the facility. Smoke detectors are required at supply and return of HVAC systems and on both sides of smoke doors.
- **Sprinkler Systems** must be installed in accordance with NFPA 13 and NFPA 75 in school facilities and buildings more than two (2) stories or if required due to the rated occupancy.

10.2.4 Evacuation Routes

Emergency escape routes are to be posted in each work area, building and classroom and reviewed with all employees and students. The primary and secondary assembly areas or rally points must be identified**.**

10.2.5 Evacuation Procedures

- Upon hearing the alarm or being notified by the designated department representative that a fire or other emergency exists, all personnel are to immediately shut down and/or secure all equipment and machinery, if possible.
- All employees without assigned emergency responsibilities are to quickly evacuate the building using the appropriate route and gather at the designated assembly or rally point. NEVER USE ELEVATORS DURING EVACUATION
- ***Evacuation in Schools***
  - √ Instructors and school administrators must ensure that students evacuate when the alarm is sounded or if told to leave the building. Each instructor should lead a prompt and orderly evacuation of his or her class to the pre-designated assembly area or location.
  - √ If the alarm sounds during class changes, students should report to the location their next class would have been.
  - √ If the alarm sounds during a lunch period, lunchroom aids and/or teachers in the lunchroom will evacuate the students.

- Personnel will be designated by the Principal or Facility Director to meet the emergency responders and direct them to the location of the fire or other emergency situation. This person should be familiar with the location of Fire Department connections, main power cutoffs, fire protection equipment and areas where flammable or other hazardous chemicals products are stored.
- Designated personnel at each facility will assist in the evacuation of physically challenged persons or students. (See the Site Specific Section)
- Since it is possible that the route to the primary assembly area, or the area itself may be inaccessible or designated unsafe, a secondary assembly or rally point should be identified.

10.2.6 Headcount

Supervisors and teachers should account for employees and students and inform the Principal, Facility Director, or Fire Warden immediately if it is determined that anyone is missing from the assembly area after an evacuation.

10.2.7 Visitors/Those with Special Needs

Teachers and employees are to notify visitors of the facility's evacuation procedures and assist them, as required, in the event of an emergency. Employees, students and visitors with special needs must receive adequate assistance to ensure their safe evacuation.

10.2.8 Incident Command

The Principal, Facility Director or their designee will be responsible for determining the appropriate actions to be taken until outside emergency response personnel arrive. At that time, the outside emergency response agency will set up an Incident Command System (ICS), take charge of the response effort and establish communication procedures with the appropriate facility or school representative(s).

10.2.9 Post-Emergency or Incident

No one may reenter buildings until notified by the Principal or Facility Director that it is safe to do so. Fire damaged areas cannot be reoccupied until the areas have been examined by qualified personnel and declared safe.

10.2.10 Emergency Call List

Emergency Call List should be posted in all schools and facilities and list the numbers to be called in the event of an emergency.

10.2.11 Emergency Response: Injury/Illness

10.2.11.1 First Aid

*Employees/teachers may render minor first aid or attempt to control an incident ONLY if they have been properly trained and authorized to do so and if they can do so safely, otherwise they should call **9-1-1**.*

10.2.11.2 Personal Injury/Illness Procedures

1) *Determine if the area where the injured is located, can be safely entered.*
2) *Determine the severity of the injury/illness if possible, without moving the individual unless they are in immediate danger.*
3) *Designate a person to call emergency medical services at **9-1-1**, if necessary.*
4) **Call if the injured:**
   - √ *Is unconscious;*
   - √ *Has trouble breathing;*
   - √ *Has chest pain or pressure;*
   - √ *Is bleeding severely;*
   - √ *Has pressure or pain in the abdomen that does not go away;*
   - √ *Is vomiting or passing blood;*
   - √ *Has seizures, a severe headache or slurred speech;*
   - √ *Appears to have been poisoned;*
   - √ *Has injuries to head, neck or back;*
   - √ *Has possible broken bones.*
5) **Provide the emergency dispatcher with the following information:**
   - √ *Your name;*
   - √ *Your telephone number, address and specific location within the facility;*
   - √ *The nature of the situation (what happened);*
   - √ *The number of people involved;*
   - √ *A description of any injuries and the condition of the injured person(s);*
   - √ *Any special circumstances (i.e., hazardous atmospheres, spilled chemicals, etc.).*
6) *Send a spotter to the facility entrance to meet and direct the outside emergency responders.*
7) *Contact the personnel listed on the* Emergency Call List.

10.2.12 Emergency Response: Fatality

10.2.12.1 Response Procedures

In the event of a fatality, the following procedures must be followed:

1) *Call **9-1-1.***
2) *Contact the personnel listed on the* Emergency Call List.
3) *Secure the area.*
4) *Gather pertinent information and notify the Office of Human Resource Services who will be responsible for notifying the following:*
   - √ *The employee's designated emergency contact;*
   - √ *The Workers' Compensation Insurance Carrier;*
   - √ *The Occupational Safety and Health Administration (OSHA) at (813) 626-1177 within eight hours of the discovery/reporting of the fatality.*

10.2.13 Fire/Explosion Response

10.2.13.1 Purpose

Procedures must be established to minimize risks to employees, students and property during a fire or explosion emergency. In addition, procedures must be established to prevent fire emergencies from occurring. (See the Fire Safety and Prevention Section *of this Plan).*

10.2.13.2 Fires

- *Notification of the presence of a fire to emergency response personnel and facility occupants is of the utmost importance.* ***The fire alarm must be sounded.***
- *All fires and explosions must be reported and students, employees and visitors warned of the emergency situation immediately.*
- *Students, and employees without responsibilities during a fire/explosion emergency, as indicated in this Plan, are to evacuate the facility immediately if directed to do so and/or if an alarm is sounded.*
- **Teachers and employees may attempt to extinguish a small (incipient) fire if:**
  - √ *It is a small fire;*
  - √ *They are properly trained and authorized to do so;*
  - √ *Their exit from the facility will not be blocked; and*
  - √ *It is considered safe to do so.*

10.2.13.3 Fire Extinguishers

- *Fire extinguishers of the appropriate class for the location will be provided throughout Brevard County School Board buildings.*
- *They will be properly mounted and their locations will be clearly identified.*
- *Each fire extinguisher will be marked with the appropriate symbols and/or pictograms designating the classes of fires on which they may be used.*
- *In order to maintain fire extinguishers in operational condition,* ***monthly*** *visual inspections will be completed by School Board personnel along with comprehensive* ***annual*** *inspections by an outside contractor.*

10.2.13.4 Fire Response Procedures

- **Upon discovering a fire, and employee must initiate one of the following:**

  Small Fire Procedure

  1) *Sound the appropriate alarm.*
  2) *Call* ***9-1-1****.*
  3) *Attempt to extinguish the fire, if properly trained and authorized to do so.*
  4) *Evacuate the facility if the fire is not immediately extinguished or if the extinguisher is emptied.*

Large Fire Procedure

1) *Sound the appropriate alarm.*
2) *Call **9-1-1**. (If necessary, do so from a cellular phone or other phone outside the facility).*
3) *Isolate gas, electrical and/or HVAC sources, if it is safe to do so.*
4) *Evacuate the facility.*

10.2.13.5 Post Evacuation Procedures

- ***After Evacuation from the Building**, the person who sounded the alarm or who has information regarding the origin of the fire or explosion must provide the following information to the emergency response personnel:*
  - √ *The location of the fire or explosion;*
  - √ *Equipment involved;*
  - √ *Isolation procedures already taken, if any;*
  - √ *Injuries or special needs people who may need assistance;*
  - √ *Additional hazards that are located within the facility (i.e., hazardous chemicals, etc.)*

- ***Additional Assignment of Duties After Evacuation from the Building**. The designated department representative or the Incident Commander may assign the following duties to employees:*
  - √ *Search teams, if needed and it is safe to conduct a search;*
  - √ *Guides to escort emergency response personnel;*
  - √ *A contact to communicate with any media who may arrive on the scene;*
  - √ *Personnel to isolate equipment.*

- **End of Emergency**

All people will be prohibited from re-entering the facility until the Incident Commander has determined it is safe to do so and has notified the designated facility representative, who will then notify all personnel. Upon re-entering the building, extreme caution is to be taken to ensure that areas are safe. It is important that all machinery and/or equipment are shut down prior to reestablishing utility service, if it has been isolated, to ensure unexpected energization cannot occur.

10.2.14 Bomb or Terrorist Threat

10.2.14.1 General Precautions

- *NEVER touch or remove a suspicious device.*
- *DO NOT assume that there is only one device.*
- *Notify authorities **immediately**.*

10.2.14.2 Procedures: Bomb or Terrorist Threat Received by Telephone

1) *Remain calm and courteous.*
2) *Obtain as much information as possible.*
3) *LISTEN carefully for background sounds and note them.*
4) *Notify another person, if possible, by note, signal or other means, to contact **9-1-1** and request help.*
5) *If a bomb threat, write down as much information as possible, including the wording of the threat and as many of the following questions as possible:*
   - √ *When is the bomb going to explode?*
   - √ *Where is it right now?*
   - √ *What does it look like?*
   - √ *What kind of bomb is it?*
   - √ *What will cause it to explode?*
   - √ *Why did you place the bomb?*
   - √ *What is you name?*
   - √ *What is your address?*
6) *Note the caller's voice, type of language used and manner, and anything else you can remember about the call.*
7) *Immediately following the threat, call **9-1-1** (if not done) and notify the Principal Facility Supervisor or your immediate supervisor, who will initiate evacuation procedures, if deemed necessary.*

10.2.15 Spills or Discharges of Hazardous Materials (Chemicals)

10.2.15.1 Chemicals on Site

A list of the hazardous chemical/materials stored in large quantities (55 gallon drums or more) at this site can be found at the end of the Section in the Site Specific information.

10.2.15.2 Minor or Incidental Spills or Discharges

- **A minor or incidental spill is one that:**
  - *Causes no injury to any person, (employee or student);*
  - *Does not cause damage to the facility or the environment;*
  - *Will not reach navigable waters;*
  - *Does not leave the property; and*
  - *Can be cleaned up safely.*

10.2.15.2 Minor or Incidental Spills or Discharges - Continued

- **In the event of a minor or incidental spill:**
  1) *Barricade the area and prevent entry.*
  2) *Obtain the Material Safety Data Sheet (MSDS) for the chemical released; determine the potential hazards, the recommended personal protective equipment (PPE) and the containment requirements.*
  3) *Ventilate the area.*
  4) *Remove all sources of ignition and ensure that a fire extinguisher is available.*
  5) *Wear appropriate PPE, as recommended by the MSDS.*
  6) *Avoid breathing vapors. Wear appropriate air-purifying respirator or self-contained breathing apparatus (SCBA) if unsure of the potential exposure*

levels or if they could possibly exceed the permissible exposure limits (PELs) established by OSHA.

7) *Stop the source of the leak, if it possible to do so safely.*
8) *Clean up spilled material(s) with spark-proof tools.*
9) *Place contaminated material and absorbents in approved containers and label in accordance with Department of Transportation (DOT) regulations.*
10) *Dispose of according to all local, state and federal regulations.*
11) *Properly decontaminate or dispose of all contaminated PPE and tools.*
12) *Review the incident and determine measures to prevent reoccurrence.*

10.2.15.3 Major Spills or Discharges

- **A major or emergency spill is any hazardous material/chemical discharge or spill that may:**
  - *Cause injury to any person, (employee or student);*
  - *Cause damage to the facility or the environment;*
  - *Reach navigable waters;*
  - *Leave the facility's property; and*
  - *CANNOT be cleaned up safely.*

- **In the event of a major or emergency spill:**

1) *Stay out of the danger zone.*
2) *Call **9-1-1** and request assistance from the location's Emergency Response Team or the Brevard County Hazardous Materials Response Team. Have a copy of the MSDS available for the HazMat Team when they arrive.*
3) *Barricade or confine the spill area from a **safe distance**. Keep other employees out!*
4) *Determine if evacuation is required, if so, notify employees and initiate evacuation procedures.*
5) *After the spill has been contained, ensure that clean up is conducted by trained Emergency Response Team members or an outside licensed contractor.*
6) *Ensure that all contaminated materials and absorbents are placed in approved containers and labeled in accordance with Department of Transportation (DOT) regulations.*
7) *Make sure that the waste is disposed of in accordance with all local, state and federal regulations.*
8) *Ensure that all contaminated PPE and tools are discarded or decontaminated.*
9) *Review the incident and determine measures to prevent reoccurrence.*
10) *Prepare a written report and notify the National Response Center at (800) 424-8802 and the State Warning Point at (850) 413-9911 within 24 hours of the incident.*

10.2.16 Weather-Related Events

10.2.16.1 Purpose

This section has been established to ensure that a plan of action is available if a tornado, severe lightning, hurricane or other major weather condition should occur in the immediate vicinity of School Board premises.

10.2.16.2 Tornados

*A **tornado watch** means that prevailing conditions indicate that tornadoes are likely.*
*A **tornado warning** means that a tornado has been sighted or is indicated by radar.*

- *If a **tornado watch** is in effect:*

  1) *The Principal or Facility Director will assign someone to monitor the situation using a weather radio.*
  2) *Employees will be notified of the tornado watch advisory and advised to remain diligent and listen for the alarm. (Identify the sound of the alarm.)*

- *If a **tornado warning** is in effect:*
  1) *If a sighting is in the geographical location, an alarm (which must differ from the Fire or Evacuation alarm) will be sounded.*
  2) *First aid providers will report their locations to the Principal, Facility Director or assigned designees.*
  3) *Clerical staff will close vaults and secure records.*
  4) *If time allows, the Principal or Facility Director or their designee will assign someone to shut off the electrical power and gas lines.*
  5) *Employees and staff will proceed to assigned shelters.*
  6) *Teachers will move all students from portables and accompany them to assigned shelters.*
  7) *While in the shelter or if unable to reach the shelter:*
     - √ *Move to small interior hallways or rooms with no windows if possible.*
     - √ *Sit or curl up on the floor with backs to corridor walls or glass areas.*
     - √ *Use coats, jackets, etc. to cover heads, arms, legs and exposed body parts from flying materials.*
  8) *The radio should be monitored to determine when the emergency has ended.*
  9) *Employees and students may not return to the school or facility until qualified personnel examine the site and determine that it is safe to do so.*
  10) *The Principal, Facility Director or their designee will announce when the emergency situation is over and determine when evacuees may leave the shelter area and return to the classroom, offices, etc.*

10.2.16.3 Hurricanes

*A **hurricane watch** means that a hurricane is possible within 24 to 36 hours.*
*A **hurricane warning** means that a hurricane will make landfall within 24 hours.*

- *If a **hurricane watch** is in effect:*
  1) *The Principal or Facility Director will assign someone to monitor the situation using a weather radio.*
  2) *Employees will be notified of the hurricane watch advisory.*
  3) *The facility shutdown procedures should be reviewed with all participants.*
  4) *A team should be established to secure the facility and responsibilities assigned.*
  5) *Determine who will determine when and if the facility should be evacuated.*

- *If a **hurricane warning** is in effect:*
  1) *Place the site on HURRICANE WARNING STATUS.*
  2) *Activate the response team and secure the facility by:*
     - √ *Ensuring that data systems are backed up and media protected.*
     - √ *Picking up and/or securing loose items outside the building.*
     - √ *Closing and locking all doors that are not emergency exits.*
  3) *At this time, Principals, Facility Directors and The Board will determine if the buildings are to be evacuated and all non-essential personnel allowed to leave.*
  4) *If evacuation procedures are implemented, employees, students, etc. will be informed of evacuation routes and shelter information, if possible.*
  5) *Bus drivers should stop at the closest available shelter if en route.*
  6) *Students and employees will be informed of the means that will be used to notify them when the emergency has ended and it is safe to return to work or school.*
  7) *If possible, the team will turn off all electric, gas and water prior to a complete facility evacuation.*
  8) *If employees remain at the facility, designated members of the administration or management must maintain contact during the emergency.*

- **After the hurricane emergency has ended:**
  1) *The Principal, Facility Director or a designee will contact qualified and authorized personnel to visit and inspect the facility to determine whether work or school activity may resume safely.*
  2) *Employees and students will be notified thought a predetermined method (radio, television, etc.) as to when it is safe to return to the facilities or resume activities.*

10.2.16.4 Lightning Storms

Lightning is random, unpredictable and the leading cause of severe weather fatalities. Since Brevard County is one of the geographical areas with the highest risk of lightning strikes, safe procedures to be followed during lighting storms must be established and followed.

- **In the event of a storm with lightning:**
  1) *Seek shelter indoors, if possible.*
  2) *Stay in an interior room away from water, electrical appliances and windows, if possible.*
  3) *Turn off or disconnect all electrical appliances.*
  4) *Use the telephone only for emergencies.*
  5) *Back up computer data and turn off or disconnect all computer systems.*
  6) *If outdoors:*
     - √ *Avoid water.*
     - √ *Avoid metal objects, i.e., electric wires, fences, golf clubs, playground equipment, machinery, motors, power tools, railroad tracks, etc.*
     - √ *Stay out of tents or golf carts.*
     - √ *Do not shelter under isolated trees; avoid hilltops and open high areas.*
     - √ *If possible, find shelter in a building or a fully enclosed metal vehicle (car, truck, etc.).*
     - √ *If unable to reach shelter, crouch as low as possible, or get down into a ditch or low lying area.*

If Lightning is Within 2-4 Miles, take Defensive Actions!

"Flash to Bang" Measurement

The time from seeing the lightning strike to hearing the thunder.

20 seconds – 4 miles away
15 seconds – 3 miles away
10 seconds – 2 miles away
5 seconds – 1 mile away

10.2.17 Loss of Utilities

The loss of a major utility may result in unsafe conditions and must be addressed to ensure the safety of all facility or school occupants.

10.2.17.1 Potable Water

- ***A loss of potable water may cause a lack of:***
  - √ *Water for eyewash stations and/or showers;*
  - √ *Water for fire response;*
  - √ *Water for drinking, hand-washing and/or sanitary facilities.*

10.2.17.2 Electricity

- ***A loss of electricity may cause a lack of:***
  - √ *A lack of illumination in the facility or work area;*
  - √ *Unexpected machinery shutdown and start-up (upon reenergization);*
  - √ *Failure of ventilation systems;*
  - √ *Operational failure of alarm systems;*
  - √ *Computer systems failure;*
  - √ *Inoperable communication systems.*

10.2.17.3 Procedures to Follow in the event of a Loss of Utilities:

1) *Notify the local fire department if water service is lost.*
2) *Ensure student, employee and visitor safety during power outages. Keep all occupants in one place as much as possible, unless notified to evacuate.*
3) *The Principal, Facility Director or their designee will contact the appropriate utility service or maintenance department immediately.*
4) *Care must be taken to ensure that when service is re-established, employees or students are not exposed to unexpected hazards. Machinery needs to be checked to ensure that controls are in the **OFF** position prior to reenergization.*
5) *Suspend all torch work, welding or burning activities.*
6) *All work with chemicals is to be suspended until ventilation systems, eye wash stations, safety showers and alarms are operational.*
7) *Computer systems are to be backed up on a regular basis and storage media placed in a safe location.*

10.2.17.4 After Utilities are Reinstated:

1) *Check for leaks, etc.*
2) *Ensure that proper restarting procedures are followed for equipment/machinery.*
3) *Ensure that safety showers, eyewash stations, ventilation systems, elevators, etc. are operational.*
4) *Check all sanitary facilities to ensure that they are not contaminated and operational.*
5) *Return water fountains to service after ensuring that no contamination has occurred.*

10.2.18 Media Communications

Only the Director of Communications or their designated representative may provide statements to media representatives who respond to an emergency at School Board of Brevard County facilities. Employees are to avoid making comments during emergency evacuation procedures and refer all inquires to the Principal, Facility Director or their immediate supervisor.

10.2.19 Recordkeeping

10.2.19.1 Retention

Record	Maintained By	Retention
Emergency/Fire Drill Documentation	**Administrators and Principals**	**1 Year**
Training	**Administrators and Principals**	**Most Current**

10.2.7 EMERGENCY EVACUATION OF PERSONS WITH DISABILITIES

The purpose of this section is to provide requirements for the evacuation of persons with disabilities from schools and ancillary facilities during emergencies and to provide instructions for conducting practice drills that include persons with disabilities.

1) At the beginning of each semester, notify the local Fire Department how many persons with disabilities routinely occupy the school or ancillary facility. Provide updates as the number of individuals change.

2) Provide the Fire Department & Police Department the name of the staff member(s) responsible for establishing accountability of occupants following the evacuation.

3) Roll call shall be taken at all assembly areas to account for all persons. The principal, facility administrator, and/or fire/police department representative shall be immediately advised of any missing persons.

4) Designate employee(s) to assist assigned persons with disabilities. Include back-up employees in case of absences. Back-up employees must be informed daily if they are to be primary responders due to absences.

5) If lifting is required, designated and back-up employees must be trained and should consult with the physical therapist, teacher or other appropriate staff on proper techniques for an individual in advance. Whenever possible, the employee(s) providing assistance should ask the person with a disability about their preference for assistance.

6) Emergency Evacuation Drills shall be performed every month school is in session. One additional drill shall be performed during the first 30 days of the school year.

   Drills including persons with disabilities shall be conducted during regular drills for the entire school.

7) Invite the Fire Department to participate in emergency evacuation drills.

10.2.7.1. Multi-Story Building Emergency Evacuations

- Elevators shall not be used for emergency evacuations. One or more evacuation chairs have been supplied to each school that has an elevator.

- Conduct classes and activities for persons with disabilities on the first floor of multi-story buildings wherever possible.

- Where classes/activities for persons with disabilities can only be conducted above the first floor, the following emergency evacuation procedures apply:

    1. Escort persons with disabilities who can walk from their multi-level evacuation points to a designated assembly area following normally prescribed evacuation egress routes.

    2. Escort persons restricted to wheelchairs to pre-designated stairwell landings on the floor level on which they are located when the emergency occurs.

       Assemble designated trained employees at each stairwell landing and use the evacuation chair or physically carry the person restricted to a wheelchair down the stairs to the first level. Designate additional staff to bring the wheelchair.

10.2.7.2. Single Story Building Emergency Evacuations

1) Students with mobility impairments, which may include those persons restricted to wheelchairs, crutches, walkers, canes, etc., shall be escorted by their assigned teacher to the designated assembly area, following normally prescribed evacuation routes. Other persons with mobility impairments shall also be escorted.

2) Persons who are restricted to a wheelchair shall be escorted to a designated assembly area following predetermined evacuation routes. Persons with disabilities who have wheelchairs, walkers, etc., SHALL have assigned to their evacuation sufficient personnel to evacuate them AND their equipment. At no time shall any equipment be left in any stairwell or egress.

3) Profoundly Mentally Handicapped students who are not ambulatory shall be physically lifted and carried to a designated assembly area by designated employees or other qualified individuals responding to the emergency. Persons with disabilities who have wheelchairs, walkers, etc., SHALL have assigned to their evacuation sufficient personnel to evacuate them AND their equipment. At no time shall any equipment be left in any stairwell or egress.

For additional assistance, contact Environmental Health and Safety staff within the Office of Plant Operations and Maintenance at (321)633-3496.

Section 11: Emergency Response Plan

11.1 Introduction

The following Emergency Response Plan provides guidelines for safe response to chemical emergencies by employees trained to respond as required by the *OSHA Hazardous Waste and Operations, Standard 29 CFR 1910.120* as well as that required by *EPA's 40 CFR 68*. A list of trained Emergency Responders for each facility will be listed in the Site Specific Section.

Any Hazardous Waste/Chemical Spill emergencies should be reported to the Environmental Health and Safety Office at 633-3496.

29 CFR 1910.120 40 CFR 68

11.2 HazWoper - Emergency Response Plan (OSHA 29 CFR 1910.120)

11.2.1 General

This Plan has been developed as a general guideline for School Board of Brevard County Facilities to enable them to handle anticipated emergencies involving hazardous substances or wastes with minimal damage or injury to personnel or the environment. It is to be used in conjunction with Site Specific Standard Operating Procedures and must be reviewed and updated at least annually.

This plan applies only to those locations that will require on-site employees to respond to chemical emergencies. This would include Brevard County School Board HAZMAT Teams.

This Emergency Response plan IS NOT required for "incidental response" to a hazardous substance release where the substance can be absorbed, neutralized or controlled at the time of release by employees in the immediate area or maintenance employees and where there is no *potential* safety or health hazard.

11.2.2 Planning and Coordination

11.2.2.1 Planning

A site survey, identifying substances, their hazards, and protective measures should be completed for each facility and placed in the Site Specific Section. Members of an **Emergency Response Team** and their level of participation must be identified for each location. (See Site Specific Section)
Training requirements for each member must be identified. (See Site Specific Section)

The Emergency Procedures Plan (Section 10) and, if applicable, the *Spill Prevention Control and Countermeasures* (SPCC) Plan, may be referenced.

11.2 HazWoper - Emergency Response Plan (OSHA 29 CFR 1910.120) - Continued

11.2.2 Planning and Coordination - Continued

11.2.2.2 Coordination

- The following **local** agencies should be contacted and their level of participation identified: (See Site Specific Section for listing of locations contacted.)

  Local Fire Department
  Brevard County Fire & Rescue Hazmat Team
  Local Emergency Response Commission (LERC)
  Nearest Hospital
  Licensed Contracted Cleanup Company

- The following **state and/or federal** agencies *may be* contacted for assistance in the event of a major emergency.

  Florida Department of Environmental Regulation
  State Emergency Response Commission
  National Response Center
  Coast Guard
  EPA

11.2.3 Personnel Roles

- ***All School Board of Brevard County personnel*** - receive Hazard Communication training and may make a determination as to whether an emergency exists. They are most likely to discover a hazardous materials release and have been trained to begin the Emergency Response process by notifying a member of the Emergency Response Team if one has been established for the facility and the proper authorities as shown on the Emergency Call list.

- ***Emergency Response Team Members*** - Team members at each location who are listed in the Site Specific Section will be provided the level of training necessary based upon their required job functions and responsibilities. In addition, practice drills that simulate actual anticipated emergency conditions must be conducted **at least annually** and documented.

11.2 HazWoper - Emergency Response Plan (OSHA 29 CFR 1910.120) - Continued

11.2.3 Personnel Roles - Continued

11.2.3.1 Minimum Training Requirements Per HazWoper 29 CFR 1910.120 (q)

Level 1 - First Responder Awareness

- √ May witness or discover a release of hazardous materials.
- √ Trained to notify proper authorities and to take NO FURTHER ACTION.
- √ No minimum number of hours of training required, Hazard Communication training may meet the requirement.

Level 2 - First Responder Operations

- √ Responds to releases or potential releases of hazardous materials as part of the initial response to the site for the purpose of protecting persons, property or the environment from the effects of the release.
- √ DEFENSIVE ACTIONS ONLY - may contain release from a SAFE DISTANCE.
- √ 8 Hours minimum training required.

Level 3 - Hazardous Materials Technician

- √ Responds to release or potential releases for the purpose of stopping the release. May approach the point of release in order to plug, patch or otherwise stop the release of a hazardous substance.
- √ PERFORMS OFFENSIVE ACTIONS AS REQUIRED.
- √ 24 Hours minimum training required.

Level 4 - Hazardous Materials Specialists

- √ Responds with and provides support to HAZMAT Technicians (Level 3).
- √ Provides specific knowledge of the various substances they may be called upon to contain.
- √ PERFORMS OFFENSIVE ACTIONS AS REQUIRED.
- √ 24 Hours minimum training required.

Level 5 - On Scene Incident Commander

- √ Assumes control of the incident scene beyond First Responder Awareness level.
- √ Must have information regarding implementation of the Emergency Evacuation Plan, the Local Emergency Response Commission Plan and the State Emergency Response Commission Plan.
- √ 24 HOURS minimum training required.

- **Management as listed on the Site Specific Emergency Call list** - Will become the *person in charge,* determine the extent of the emergency, and whether to contact local, state, and federal agencies as well as whether to sound the alarm and evacuate the area, if not already initiated.

The responding off-site agency's Incident Commander will assume control of the scene upon their arrival.

11.2 HazWoper - Emergency Response Plan (OSHA 29 CFR 1910.120) - Continued

11.2.4 Hazard Recognition

Recognition - All School Board of Brevard County employees receive annual Hazard Communication training in the hazards of the specific chemicals used. **(First Responder Awareness Level I)** They are trained to recognize hazard warnings as indicated by the symbols and color-coding shown on labels, signs and placards. In addition all employees are trained to read and interpret Material Safety Data Sheets (MSDS's) and are aware of their location at their worksite.

11.2 HazWOper - Emergency Response Plan (OSHA 29 CFR 1910.120)

11.2.4 Hazard Recognition

Recognition - All School Board of Brevard County employees receive annual Hazard Communication training in the hazards of the specific chemicals used. **(First Responder Awareness Level I)** They are trained to recognize hazard warnings as indicated by the symbols and color-coding shown on labels, signs and placards. In addition all employees are trained to read and interpret Material Safety Data Sheets (MSDS's) and are aware of their location at their worksite.

11.2.5 Safe Distances, Places of Refuge, Evacuation Routes

- After hazards have been identified, spill areas will be barricaded by the Emergency Response Team members at a safe distance as suggested by the *DOT Emergency Response Guidebook*. Employees not involved in emergency response activities, will no longer be allowed in this area until the local emergency agencies deem it safe to enter.

- In the event of an emergency or hazardous release requiring evacuation, employees, if instructed, or upon hearing the alarm, will gather at the assembly area as indicted in the Site Specific Section which is designated as an area of "safe refuge".

11.2 HazWoper - Emergency Response Plan (OSHA 29 CFR 1910.120) - Continued

11.2.6 Security

- Any School Board employee who discovers a release or spill may place barricades and barrier tape around an area until the situation is determined to be an "emergency" rather than "incidental" spill. **This must be done from a safe distance.**

- If available, a site Emergency Response Team member who is first on the scene may further determine the extent of the exclusion or danger zone and reinforce security. An attendant will be assigned to prevent entry into the area until a trained Emergency Response Team or the Brevard County Fire and Rescue HAZMAT Team arrives.

- The *Incident Commander* will then coordinate with the "person in charge" and establish the level of security required.

11.2.7 Emergency Medical Treatment and First Aid

- Emergency Response Team members are First Aid/CPR trained and may perform this function if the injured person is not contaminated and needs immediate attention.

- The first response, however, would be to contact a fellow employee to call local medical services as shown on the Call list.

- Injured personnel would be treated at the nearest medical facility (See Site Specific Call List). The hospital would be notified of any special decontamination procedures if hazardous chemicals or substances have contaminated the injured party

11.2.8 Personal Protective Equipment (PPE) and Emergency Equipment

Materials and equipment for emergency response are available at all times and are accessible if there is spill or release. The location of these materials and equipment is indicated in the Site Specific Section and used only for emergency response activities. Materials must be maintained in working order, inspected and certified as required and inspected **before use or at least monthly. A minimum inventory** (as listed in the Site Specific Section) is always maintained.

11.2 HazWoper - Emergency Response Plan (OSHA 29 CFR 1910.120) - Continued

11.2.8 Personal Protective Equipment (PPE) and Emergency Equipment - Continued

Suggested Response Materials List
(See Site Specific Section for Actual Location Listing)

Shovels (1 round point and 1 square point)

Granular oil absorbent
Counteragents or neutralizers
Emergency barrier tape, cones, barricades
Absorbent rolls, pads, booms
Sand bags
Face shield
Rubber boots
Appropriate gloves
Personal protective gear (Level A-D, as necessary)
Respirator w/appropriate cartridges (for chemicals on site)
Self-contained breathing apparatus (SCBA), if necessary
Leak patch kits
Rescue equipment, as necessary (tripods, harnesses, etc.)

Levels of Personal Protection that may be required for Emergency Response:			
Type A	**Type B**	**Type C**	**Type D**
Positive pressure SCBA	Positive pressure SCBA	Full face air-purifying respirator	Coveralls
Fully encapsulating suit (chemical resistant)	Chemical resistant clothing (coveralls, suit)	Chemical resistant clothing (splash suit)	Safety boots/shoes
Inner and outer chemical resistant gloves	Chemical resistant rubber boots	Chemical resistant rubber boots	Gloves
2-way radio	Chemical gloves	Chemical gloves	Safety glasses or splash goggles
Chemical resistant safety boots/shoes	Hard hat	Hard hat	Hard hat
	2-way radio	Safety goggles	
USE IF: The chemical has	USE IF: The chemical has	USE IF: The chemical has	USE IF: The chemical has

been identified and requires protection for skin, eyes and respiratory system or there is high potential for splash or exposure to unexpected vapors, gases or particulates of material that that are harmful to the skin or capable of being absorbed through the skin.	been identified and requires respiratory protection but less skin protection.	been identified and requires some respiratory protection but less than B.	been identified and requires no respiratory, and minimal skin protection.

11.2 HazWoper - Emergency Response Plan (OSHA 29 CFR 1910.120) - Continued

11.2.9 Decontamination

- All materials, clothing, tools, equipment and cleaning agents (such as water) will be captured and contained. These items will be either completely decontaminated for future use or disposed of.

- The *Emergency Response Team members* who have been trained in DECON at the First Responder Operations Level II may perform this function in the event of an emergency. The *Incident Commander* will assign a DECON crew and set up a DECON area.

- The *Incident Commander* will choose the method of decontamination to be used as determined by information available such as the site survey, or MSDS regarding the specific chemical and its hazards.

11.2.10 Emergency Response Procedures

***11.2.10.1 Notification**:*

1) Upon discovering a possible emergency situation or hazardous material release, **the employee** must contact the personnel listed on the posted Emergency Call List and provide the following, if known:
   - Name of employee making call & telephone number where he/she can be reached;
   - Location and nature of problem;
   - Name of material(s) involved in emergency and quantity of material on hand;
   - Facility name and address;
   - Local weather and site conditions;
   - Location of closest schools, hospitals, etc;
   - Injuries or exposures.

2) The **first "School Board"** person contacted will then be the most senior person or "person in charge". (This responsibility may change as more senior personnel are contacted or arrive at the scene.)

3) If Brevard County School Board employees, or other personnel not involved in Emergency Response Activities, may be exposed to injury or hazards, Emergency Evacuation Procedures will be initiated.

4) The "person in charge" will then contact those members of the Emergency Response Team, outside Emergency Response agencies and other members of management who have not yet been called, as required.

11.2 HazWoper - Emergency Response Plan (OSHA 29 CFR 1910.120) - Continued

11.2.10 Emergency Response Procedures - Continued

11.2.10.2 Response

1) **On Scene Incident Commander (Level V) -** The senior (or designated) official from the responding Emergency Response Team or outside agency will take charge of the scene, establish a communication system, set up a command area in the "Safe Zone" and assume the duties of Incident Commander.

The Incident Commander will ASSESS the situation:

- √ Is there a fire, spill or leak?
- √ What are the weather conditions, rain, and wind direction?
- √ What is the terrain like?
- √ Who/what is at risk: people, property, and the environment?
- √ Is there a danger to the community?
- √ Should other agencies be notified?
- √ What actions should be taken?
  - — Monitoring for exposure levels?
  - — Evacuation?
  - — Confinement, diking, damming?

The Incident Commander will, based on the assessment:

- √ Plan the appropriate emergency response and assign duties to Emergency Responders.

- √ Determine level of required PPE.
- √ Coordinate with other agencies if deemed necessary (LERC, SERC).
- √ Evaluate progress of plan to ensure that objectives are being met.
- √ Communicate with all participants and inform School Board representatives of the status of the response effort.

2) The **First Responder(s), Operations (Level II)** will take the following *defensive* actions from a safe distance:

- Secure and barricade the spill area.
- Assign an attendant if necessary.
- Confine the spill, using sand bags, absorbent pads, or earth.

- Stop the leak/discharge if it can be done from an area outside the "Hot Zone" and if it can be done so safely.
- Assist in response activities as assigned by the Incident Commander WITHOUT EXCEEDING THE LIMITS OF LEVEL II TRAINING.

11.2 HazWoper - Emergency Response Plan (OSHA 29 CFR 1910.120) - Continued

11.2.10 Emergency Response Procedures - Continued

11.2.10.2 Response - Continued

3) The **First Responders, Technician (Level III)** will take the following actions:

- Don appropriate level Personal Protective Equipment or level A protection if identity of chemicals or exposure levels are unknown.
- Approach area cautiously; stay upwind if possible.
- If the scene has not yet been secured, or isolated and barricaded, do so.
- Identify the product and its hazards if not known. Read signs, container labels, or utilize personnel designated to provide site-specific information.
- Monitor materials, exposure levels, etc. using meters, instruments, etc.

- Approach point of release and stop leak if possible by best method available; i.e.; plug, patch, change position of container, etc.
- Perform any other response activities as assigned by the Incident Commander WITHOUT EXCEEDING THE LIMITS OF LEVEL III TRAINING

4) The "person in charge" or his designee will stand by and provide site specific information, including MSDS's, Emergency Response Plans, Evacuation Procedures, topographical maps, SPCC plans, Hazard Communication program, etc. to the Incident Commander.

The Incident commander may assign a "Hazardous Materials Specialist (Level IV)" to obtain the above information and assist in development of the response plan.

5) The Incident Commander will assign a representative to thoroughly and objectively document all activities.

11.2.10.3 Decontamination

1) The Incident Commander will establish a DECON plan that includes:
   - Number and layout of stations;
   - Equipment needed;
   - Appropriate methods of removal or inactivation of contaminant;
     - Water, rinsing
     - Chemical leaching and extraction
     - Evaporation
     - Scrubbing/scraping
     - Steam Jets
     - Chemical detoxification
     - Disinfections or sterilization
   - Procedures to prevent contamination of clean areas;
   - Methods to minimize worker contact during PPE removal;
   - Methods for disposing of clothing and equipment that is not decontaminated.

11.2 HazWoper - Emergency Response Plan (OSHA 29 CFR 1910.120) - Continued

11.2.10 Emergency Response Procedures - Continued

11.2.10.3 Decontamination - Continued

Members of the Emergency Response Team who are required to assist in decontamination of equipment and Technician level personnel must wear PPE and clothing at a level equal to or one less than that of the contaminated workers.

Contaminated waste must be captured and containers provided for their containment.

11.2.10.4 Cleanup

1) In the event of a major spill, each facility will enlist the aid of regulatory agencies and a licensed contractor as indicated in the Site Specific Section to complete the cleanup.

2) School Board personnel will label and prepare paperwork necessary to ship the contaminated waste to an approved treatment disposal and storage (TDS) facility via a licensed transporter.

11.2.10.5 Follow-up

1) All government agencies will be notified, as required.

The State Warning Point and the National Response Center must be notified in 24 hours in the event of a "major spill". (See *Emergency Procedures Section*)

2) A written report of all activities will be prepared, reviewed and activities critiqued to determine the success of the emergency response and to identify areas for improvement and prevent reoccurrence. (This report will be kept on file.)

The report will contain at a minimum:

Chronological history of the incident;
Facts about incident and when they became available;
Names and job titles of personnel involved;
Actions taken; (Who did what and why?)
Samples and test results;
Possible exposures;
History of injuries or illnesses during or as a result of the emergency;
Environmental impact.

3) Materials and equipment used in the operation will be replaced.

11.2 HazWoper - Emergency Response Plan (OSHA 29 CFR 1910.120) - Continued

11.2.11 Medical Surveillance

- Members of an organized and designated HAZMAT or Emergency Response Team must receive a baseline physical examination.
- A medical exam must be made available for any emergency responder who has signs or symptoms that may have resulted from exposure to hazardous substances during an emergency incident.
- Emergency responders will be monitored during Emergency Response Activities for stress related symptoms related to wearing protective equipment, working under temperature extremes or general stress caused by life-threatening emergencies.

11.3 Recordkeeping

11.3.1 Records Retention

Record	Maintained By	Retention
Emergency Response Plan	**Environmental Health and Safety Office**	**Most Current**
Training	**Environmental Health and Safety Office**	**5 Years**
Medical Surveillance Records	**Environmental Health and Safety Office**	**30 Years after employment ends**

Section 12: Ergonomics

12.1 Introduction

While performing work, School Board of Brevard County employees may be exposed to cumulative trauma disorders (CTDs) or repetitive motion injuries (RMIs) through their environment, the tools, equipment and machinery they use, or the work practices they follow. It is the goal of this Plan to reduce those exposures by providing ergonomics education, risk analysis and controls to prevent occupational injuries and illnesses and improve employees' comfort and safety. If you are experiencing any symptoms or need ergonomic counseling, please call the Environmental Health and Safety office at 633-3496.

12.2 Cumulative Trauma Disorders

12.2.1 General Symptoms of Cumulative Trauma Injuries or Illnesses Include:

- √ Loss of grip strength, difficulty holding objects;
- √ Pain or discomfort in the hand, arm, fingers;
- √ Tingling or numbness in hands, fingers;
- √ Difficulty making a fist or opening or closing fingers;
- √ Loss of feeling in fingers.

Employees must report symptoms promptly. *It is important to get medical help as soon as possible, since it is often possible to reverse the condition with early intervention*.

12.2.2 Common Cumulative Trauma Disorders (CTDs)

- ***Back Injuries***
  - Pulled, strained muscles, ligaments, tendons and disks in the back area.
  - Lower back pain, *may affect areas other than the back.*
  - Frequently caused by cumulative effects of faulty body mechanics; excessive twisting, bending, reaching, carrying or lifting loads too heavy or big; staying in one position for too long, poor physical condition or poor posture.
- ***Carpal Tunnel Syndrome***
  - Compression and entrapment of the median nerve when it passes through the wrist into the hand, in the carpal tunnel by inflamed tendons.
  - Symptoms include pain, tingling, numbness, and swelling, often felt at night. There may be a lack of strength in the hand and inability to make a fist, hold objects, etc. Caused by repetitive and/or forceful manual tasks performed over a period of time.
- ***Reynaud's Syndrome (White Finger)***
  - Vascular damage to blood vessels in hand. Skin, muscles die from lack of oxygen.
  - Symptoms include intermittent numbness, tingling in fingers; skin turns pale, ashen cold. Loss of sensation and control in fingers and hands.
  - Caused by repeated exposure to hand vibration over long period of time. Intensified with exposure to extreme cold.

12.2 Cumulative Trauma Disorders - Continued

12.2.2 Common Cumulative Trauma Disorders (CTDs) – Continued

- ***Tendonitis***
  - Inflammation of the tendon.
  - Symptoms include localized pain at the site of the affected tendon.
  - Caused by overuse or unaccustomed usage of the wrist and shoulder. May calcify, fray or tear apart. May be permanently weakened.

- ***Tennis Elbow***
  - Inflammation of tissues, usually on the thumb side of the elbow.
  - Symptoms include swelling, pain.
  - Caused by rotation of the palm up against resistance or violent or highly repetitive action, such as use of screwdriver.

- ***Tenosynovitis***
  - Inflammation or injury to synovial sheath surrounding the tendon.
  - Symptoms include swelling, pain in affected area, cracking sounds.
  - Caused by repetitive motion using hands and wrists or awkward wrist positions.

- ***Thoracic Outlet Syndrome***
  - A disorder of the shoulder that affects the nerves of the upper arm.
  - Symptoms are loss of feeling on little finger side of the hand and arm, with pain, weakness and deep dull aches in the arm and hand. Difficulty holding small objects.
  - Caused or aggravated by performing overhead tasks for long periods of time.

12.3 Identifying Risk Factors

12.3.1 Risk Factor Analysis Process

- A Job Hazard Analysis can be completed specifically to identify ergonomic risk factors associated with each task or step and records and data should be examined. (SAF 200, Injury Reports, etc.)

- Evaluate:
  - The method used or required to do the task;
  - The effort or strength required to do the task;
  - The location or position of the parts, equipment or tools;
  - The speed or frequency of the work;
  - The duration or repetition of the tasks;
  - The design of the parts, equipment or tools;
  - The environmental conditions, such as light, noise, temperature and air quality;

The worker's size, strength, ranges of motion, and physical capabilities.

12.3 Identifying Risk Factors - Continued

12.3.2 Risk Factors Include actions or other exposures such as the following that could damage the muscles, nerves, or tendons:

- ***Stressful Postures and Positions***
  - **Wrist** at any positions other than straight.
  - **Shoulder** - reaching above shoulder height.
  - **Cervical Spine (Neck)** - bending neck forward or backward for long periods.
  - **Lower Back** - twisting, bending, reaching, carry loads too heavy.

- ***Forceful Exertions***
  - Applying **high levels of force** to tools, parts, physical objects, with the hands, arms, fingers. (gripping, pinching, squeezing, striking)
  - Heavy exertions such as **lifting, pushing, pulling or carrying** heavy objects that exceed the strength or recovery capabilities of the worker.
  - **Static exertion,** performance of task from one position (sitting or standing) for an extended time.
  - **Contact** between body parts and **hard or sharp edges** of tools, parts or work surfaces.

- ***Repetition***
  - Performing a task or job **over and over** without sufficient recovery time.

- ***Vibration***
  - **Whole body**- lying, standing, sitting on vibrating equipment for long period of time. (Drivers)
  - **Segmental Vibration**- Hand-arm, caused by vibrating tools or work pieces.

- ***Duration***
  - The amount of time (minutes or hours per day) a worker is exposed to an ergonomics-related hazard.

- ***Lack of Recovery Time***
  - When the body (muscles, nerves, tendons) does not have time to rest or change to a lower stress activity.

- ***Working Environment (Conditions)***
  - Temperature extremes - hot or cold.
  - Lighting - glare, poor lighting.
  - Noise greater than 85 dB.

- ***Human Factors***
  - Stress caused by cognitive demands, decision-making, work organization, workload or overtime.

12.4 Hazard Prevention, Control or Elimination

12.4.1 Controls

1) ***Engineering Controls*** are the preferred method of control where feasible. They involve making changes to workstations, tools or equipment used on the job, or fitting the job to the person, not forcing the person to fit the job.

2) **Work Practices** include developing and training the employees to use safe and proper work techniques, along with instruction in how to maintain, adjust and modify equipment.

3) **Administrative Controls** are used to reduce the duration, frequency and severity of exposure to ergonomic hazards.

4) **Personal Protective Equipment** is used only when the other methods cannot be used to control or eliminate the hazard. *Training in the appropriate use, care and maintenance of the PPE to be used must be provided.*

12.4.2 Hazard Prevention

- **Materials Handling**

  If possible, provide handles or cutouts; this will make grasping easier and allow items to be carried closer to the body.
  Keep work between the knee and shoulder height.
  Use proper lifting techniques. See the **Materials Handling Section** of this Plan.
  Take frequent breaks-allow for recovery when making frequent lifts.
  Make sure the load is in front of the person lifting and easily accessible.
  If the load is too heavy, get help.
  Use mechanical assistance such as a hand truck, hoist, forklift, etc.

Use conveyor belts where possible to eliminate lifting.
Never twist or bend at the waist when lifting.

12.4 Hazard Prevention, Control or Elimination - Continued

12.4.2 Hazard Prevention - Continued

- **Workspace Stations should:**

Be large enough to allow for full range of motion;
Be adjustable to accommodate all sizes of worker;
Be designed for the specific task;
Have frequently used items within an arm's reach;
Allow a variety of work positions, to avoid static postures;
Have enough space for tools and equipment;
Allow employees to maintain neutral positions and avoid awkward or extended reaches;
Have work surfaces at the proper height and angle to fit the worker, equipment, tools;
Have standing or walking surfaces designed to prevent slipping and anti-fatigue mats, or footrests where employees must stand for long periods of time;
Have seating that is comfortable, adjustable, with lower back supports and that permit feet to be supported on the floor or a foot rest;
Have mechanical devices that hold objects so that employees do not have to use their hands or bodies to do so.

See the *Office Safety Section* of this plan for *specific* instructions for setting up video display terminals and computer workstations.

- **Work Environment**

Reduce noise exposures by installing barriers, reducing metal parts with rubber or nylon, reducing vibration or good maintenance on equipment.
Ensure that the lighting is bright enough without causing glare.
Use good housekeeping; keep floor surfaces clean to prevent slips and falls.
Keep passageways free from obstructions that could result in accidents or injuries to the back.
Try to keep employees from exposure to excessive heat or cold.
Provide adequate ventilation.

- **Work Methods**

Perform work so that neutral positions are maintained.
Keep wrist straight when using tools or grasping objects.
Avoid stooping, reaching and working with hands overhead for prolonged periods without changing position.
Take frequent, shorter breaks from repetitive tasks.
If standing for long periods of time, change positions frequently, place one foot on a low stool or platform or stand on a cushioned mat.
Rotate tasks, use different muscle groups.
Avoid pinch positions or use of fingers to apply pressure for many repetitions or long duration without relief.

12.4 Hazard Prevention, Control or Elimination - Continued

12.4.2 Hazard Prevention - Continued

- **Tools**

When purchasing tools, consider the ergonomic features.
Tools should be light-weight and handles designed to allow a relaxed grip so wrists can remain in a neutral (handshaking) position.
Tools should be designed for use with either hand.
A variety of grip sizes should be available, so each employee can use proper size.
Handles should be shaped so that they contact the largest possible surface of the inner hand and fingers.
Avoid tools with sharp edges and corners.
Put items in a vise when possible, to reduce unnecessary grasping force.
Power tools should be used to reduce the amount of human force or repetition required.
Using rubber sleeves can reduce tool vibration, however if the handle size is increased requiring additional gripping force, this may be counterproductive.

When purchasing new equipment, tools, machinery, etc., ergonomic design and safety should be considered.

- **Mechanical Stress**

Move equipment so that the worker does not have to lean against a hard edge or pad the hard or sharp edges.

- **Personal Protective Equipment (PPE)**

  Gloves may be worn to reduce the effects of vibration or force.
  Rubber-backed mats or carpeting can assist in reducing noise, vibration, or fatigue.
  Back-belts may help with lifting technique.

All PPE should be used with caution to ensure that it does not create a hazard by requiring more force or giving a false sense of security.

12.5 Training

12.5.1 General Training should be provided to exposed employees and should include:

- Signs and symptoms of cumulative trauma disorders (CTDs);
- How to recognize risk factors;
- How to recognize and report symptoms;
- Prevention techniques, such as use, adjustment and maintenance of tools and equipment and best work procedures for minimizing risk;
- Job specific training appropriate to the task, such as safe lifting procedures, how to set up an office workstation, etc.

12.5.2 Supervisor Training should include the above and:

- How to recognize early signs and symptoms of CTDs in fellow workers;
- How to recognize and correct hazardous work practices;
- How to direct workers to the appropriate Heath Care provider.

12.6 Recordkeeping

12.6.1 General

Job Hazard Analyses and training records will be maintained on file.

12.6.2 Records Retention

Record	Maintained By	Retention
Job Hazard Analyses	Environmental Health and	Most Current

	Safety Office	
Training	**Environmental Health and Safety Office**	**Most Current**

Section 13: Excavations/Trenching and Shoring

13.1 Introduction

In order to reduce the frequency and severity of excavation accidents and injuries, the following safe work procedures have been developed. All employees who are involved in excavation work must adhere to these guidelines in order to ensure that those exposed to the hazards of such work are protected from injury or death.

OSHA 29 CFR 1926.650-652 **Florida Statute 556.101-111** **Trench Safety Act**

13.2 Definitions

***Excavation* -** any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.

Trench - a narrow excavation that is not greater than 15 feet wide and in which the depth is greater than the width.

13.3 Site Hazard Analysis

13.3.1 Site Conditions

- **Before beginning excavation operations, the following must be considered:**

1) Are workers exposed to vehicular traffic?
2) Are there other structures, such as buildings, sidewalks, pavement, etc. close to the excavation site?
3) Have the underground utility lines been located?
4) Are there overhead power lines that equipment could come in contact with?
5) What is the condition and type of the soil?
6) What is the estimated depth and width of the excavation?
7) Is there potential for an oxygen deficient or hazardous atmosphere in the excavation area?
8) Are there any other hazards that employees may be exposed to?

13.3.2 Safety Equipment

- Is monitoring equipment available if necessary?
- Is the required personal protective equipment (PPE) on site, readily available, and in good condition?
- Are the protective system components (supports, shoring materials, shields, etc.) on site and in good condition?

13.3.3 Other

- Are employees trained to perform the work they are assigned to do?
- Is there a trained **Competent Person** on site?

13.4 Safe Work Procedures

13.4.1 If Vehicle Traffic is in the Area

- Workers exposed to vehicular traffic need to wear warning vests or other garments made of *reflective or high-visibility material*.
- The operator of mobile equipment operated adjacent to an excavation, if required to approach the edge, must have a clear and direct view or a warning system such as barricades, mechanical or hand signals or stop logs.
- Employees must not stand under any equipment bearing a load.
- Employees are required to stand away from vehicles being loaded or unloaded.

13.4.2 If There Are Other Structures Near an Excavation Site

- If an excavation may weaken a building, structure, sidewalk, etc. and expose workers to danger, supports, bracing etc., must be provided to protect employees.

13.4.3 Underground Utilities

- The location of sewer, telephone , fuel, electric, water or other underground installations must be determined prior to excavation.
- Utility companies need to be contacted and advised of the proposed work and asked to provide the locations of utility installations.

Sunshine State One-Call of Florida @ 1-800-432-4770 may be contacted to determine the location of underground utilities. Calls may be made up to 5 days before work is started, but must be made no later than 48 hours before the excavation begins.

- A means of protecting employees from exposed underground installations needs to be provided.

13.4.4 Overhead Power Lines

- Overhead power lines in the work area must be de-energized, or employees must maintain safe clearances (minimum of 10 feet) at all times if conductive equipment or material could come in contact with the overhead line(s).

13.4 Safe Work Procedures - Continued

13.4.5 Entry and Exit from the Excavation

- A stairway, ladder, ramp or other safe means of exit must be provided in excavations of 4 feet or greater in depth. They must be placed no more than 25 feet apart laterally.
- If structural ramps are used by employees for entry and exit, they must be designed by a trained competent person.
- Walkways must be provided where employees or equipment will cross over excavations. Guardrails must be provided when walkways are 6 feet or greater from the lower level.

13.4.6 Protection from Additional Hazards

- If there is a potentially hazardous or oxygen deficient atmosphere, a **competent person** must perform the appropriate test(s) and provide adequate controls such as ventilation or respiratory protection for the work area. These controls must be tested regularly to determine accuracy.
- In areas where atmospheric hazards could be expected to occur, such as landfill areas or in areas near hazardous materials storage, the atmosphere in an excavation greater than 4 feet must be tested before entry is permitted.
- Materials or equipment that could roll back into the excavation or pose a hazard must be kept at least *2 feet from the edge of excavations or be restrained*.
- Protection from loose rock or soil must be provided by removal, barricades, etc.

13.4.7 Surface and Ground Water

- Workers must not work in excavations where water has accumulated unless adequate protection can be provided. Special support or shielding systems or use of a safety harness and lifeline.
- Equipment used to control or prevent water from accumulating must be monitored by a **competent person** to ensure proper use.

13.4.8 Emergency Rescue Equipment

- If there is a potential for a hazardous atmosphere to develop in the excavation, appropriate rescue equipment, such as SCBA and personnel retrieval equipment, must be on hand.
- Employees who enter deep shafts with confined footing, need to wear a harness with a lifeline attached.

13.4 Safe Work Procedures - Continued

13.4.9 Inspections

- A **competent person** will need to examine the ground in order to determine that there is no potential for a cave-in. *If there is a potential for a cave-in, a 1 ½ to 1 ratio (34 degree) slope must be provided*.
- A **competent person** must inspect excavations and adjacent areas daily for:
  - Possible cave-in conditions;
  - Failure of protective systems and equipment;
  - Hazardous atmospheres;
  - Any other potential hazard.
- A **competent person** must inspect the excavation after events such as heavy rain or blasting in order to ensure the integrity of the excavation.

If the competent person determines that the excavation may be unsafe or if any hazardous condition exists, employees must be removed from the unsafe area, IMMEDIATELY, until proper precautions are taken.

13.5 Support Systems

13.5.1 Selection of System

- If employees are exposed to a potential cave-in, they must be protected by one of the following:
  - Slope of the excavation;
  - Supporting the sides of the excavation;
  - Placing a shield between the side of the excavation and the work area.
- The type of protection must be selected based upon:
  - The soil classification
  - Tabulated data
  - Designs by a professional engineer (*Sloping and benching for excavations greater than 20 feet deep must be designed by a registered professional engineer (PE))*

If the excavation is less than 5 feet deep and the competent person who inspects the excavation determines that there is no danger of a cave-in, the above protective measures may not be necessary.

13.5.2 Soil Classification

If sloping and benching systems will be designed as a method for protecting workers from cave-ins, a competent person must determine whether a soil is Type A, Type B or Type C in accordance with *OSHA 29 CFR 1926 Subpart P, Appendix A.*

13.5 Support Systems - Continued

13.5.2 Soil Classification - Continued

- **Examples of Soil Types**

  Type A = Clay, silty clay, sandy clay, clay loam, cemented soils (hardpan).
  Type B = Angular gravel (crushed rock), silt, silt loam, sand loam.
  Type C = Gavel, sand, loamy sand, etc.

13.5.3 Sloping

- The following are the maximum allowable slopes for excavations less than 20 feet deep:

  Stable Rock - Vertical (90°)
  Type A - ½:1 (63°) (if < 12 feet deep & short term)
  Type A - ¾:1 (53°) (if > 12 feet)
  Type B - 1:1 (45°)
  Type C - 1 ½:1 (34°)

- ***The Following are a few examples of Sloping Configuration***

***Sloping:* Option 1**

Soil not classified - excavation less than 20 feet deep - angle can be no steeper than 1 ½ horizontal to 1 vertical. (34°)

***Sloping:* Option 2**

Soil classified as Type A - excavation less than 12 feet deep (short term < 24 hours) maximum allowable slope = 1/2:1 (63°)

***Sloping:* Option 3**

Soil classified as Type A - excavation less than 20 feet deep maximum allowable slope = 3/4:1 (53°)

Sloping: Option 4

Soil classified as Type A - excavation less than 20 feet deep - maximum allowable slope = 3/4:1 (53°) Simple Bench Style

Sloping: Option 5

Soil classified as Type B - excavation less than 20 feet deep - maximum allowable slope = 1:1 (45°)

Sloping: Option 6

Soil classified as Type B - with vertically sided lower portions - excavation less than 20 feet deep - maximum allowable slope = 1:1 (45°) with shielded or supported sides of 18 inches.

Sloping: Option 7

Soil classified as Type C - excavation less than 20 feet deep - maximum allowable slope = 1 ½:1 (34°)

Sloping: Option 8

Soil classified as "layered" with different classifications - (classify as to weakest layer or use slope according to each layer) -excavation less than 20 feet deep - maximum allowable slope for B layer = 1:1 (45°) and maximum allowable slope for A layer = 3/4:1 (53°

13.5.4 Shoring and Shielding

- If shoring or shielding is selected, soil classification by a **competent person** is required.
- One of the following options must be used:
  - Appendices A and C of OSHA Subpart P must be followed; (e.g., timber shoring)
  - Systems must be designed using the manufacturer's tabulated data;
  - Other tabulated data;
  - Designed by a professional engineer.
- Materials and equipment used for protective systems must be free from damage or defects.
- Manufactured equipment and materials must be used and maintained in a safe manner according to the manufacturer's recommendations.
- Materials and equipment, if damaged, must be inspected by a **competent person** and evaluated to ensure their integrity. If equipment does not meet standards, it must be removed from service, evaluated, and approved by a registered professional engineer before being returned to service.
- Members of support systems must be securely connected together to prevent sliding, falling, etc.

- Systems must be installed and removed in a manner that does not endanger the safety of employees.
- Individual members of support systems must not be subjected to loads exceeding their design.
- If individual members are removed temporarily, additional precautions must be taken to ensure the safety of employees.
- Removal must begin at the bottom of the excavation and individual members must be released slowly.
- As support systems are removed, back filling should be done.
- Installation of a support system must be coordinated with the excavation of trenches.
- A shield system must not be exposed to a load exceeding its design.
- Shield systems must be installed in such a manner as to restrict lateral or hazardous movement if a lateral load is suddenly applied.
- Employees must be protected from the hazard of cave-ins when entering and exiting areas protected by shields.
- Employees are not allowed in shields when they are being installed, removed, or moved vertically.

13.6 Training

- Training is mandatory to ensure that **competent** persons who are required to inspect excavation work meet the following standards:
  1) Have sufficient knowledge, as shown in the 29 CFR 1926.652, to conduct daily inspections;
  2) Know the risks associated with trenching and excavation work;
  3) Understand how to protect employees from these hazards.

- Training is required initially, before work begins, and as necessary thereafter.

13.7 Recordkeeping

13.7.1 Retention

Record	Maintained By	Retention
Training Records	**Environmental Health and Safety Office**	**Most Current**
Design Drawings	**Environmental Health and Safety Office**	**Duration of Project**

14.1 Introduction

The following policies and procedures are to be followed by employees in order to reduce exposure to fire hazards at School Board of Brevard County facilities. It is essential that employees conduct their operations in a manner that will minimize the possibility of fires in the workplace in order to reduce their exposure to injury and damage to property.

29 CFR 1910.38 29 CFR 1910.106 29 CFR 1910.107 29 CFR 1910.157 NFPA 101, Chapters 10 & 11 SREF Chapter 4 & 5

14.2 Fire Safety and Prevention Responsibilities

14.2.1 Employees Must:

- Conduct their operations in such a way as to minimize the possibility of fire and follow all the guidelines presented in this Section.
- **Immediately** report fires, smoke or potential fire hazards to the local fire department.

Any employee with the proper training in the use of portable fire extinguishers can extinguish a small fire before it becomes out of control, such as trash/waste fires, motor/electrical fires and grass fires.

14.2.2 Supervisors Must:

- Be responsible for keeping their operating areas safe from fire.
- Along with their staff, assist in identifying fire risks and reducing or eliminating them accordingly.
- Ensure that their employees are properly instructed regarding potential fire hazards involved in their work and workplaces as well as the proper precautions necessary to minimize fires.
- Ensure that their employees are instructed in the proper procedures to follow in case of a fire.

14.2.3 Principals, Facility Managers or their Designees Must:

- Provide adequate classes and training materials on fire prevention and response, including fire safety and fire extinguisher operation (if required).
- Ensure that fire-extinguishing equipment is provided and properly maintained.

14.3 General Requirements

14.3.1 Fire Exits

Buildings must have continuous and unobstructed exits to permit prompt evacuation of the occupants and allow necessary access for responding emergency personnel.

- √ Exits must NEVER be obstructed, even temporarily.
- √ Exit doors must be kept unlocked.
- √ Exits must be clear of combustible materials. (Example: recyclable waste paper).
- √ Good housekeeping practices are to be followed.
- √ Exits must discharge directly to the street, a yard, court or other open space that gives safe and accessible access to the street.
- √ Never store furniture, equipment, supplies, etc., in exit ways, even for a short time.

14.3.2 Emergency Lighting

Adequate lighting must be provided in all exit aisles, corridors and passageways when such areas present an exit hazard during a power failure.

14.3.3 Fire Drills

During the first two weeks of each school year, two practice drills must be conducted with monthly, unannounced evacuation drills for the remainder of the year.

14.3.4 Smoking Policy

Smoking is not allowed in areas where:

- √ Flammable gases or liquids are stored, handled or used.
- √ Significant quantities of combustible materials; i.e. paper, wood, cardboard or plastics are stored, handled or used.
- √ Liquid or gaseous oxygen is stored, handled or used.
- √ Tapes and records are stored and computer equipment is located.
- √ Inside schools, buildings and any areas designated as “no smoking”.

14.3.5 Food Service Facilities

- √ Food service facilities and instructional kitchens must be in compliance with NFPA 12, NFPA 17, and NFPA 96.
- √ If such facilities are not sprinkle red as part of a Class A or Class B assembly occupancy, the wall and openings separating the kitchen from the dining are must have a one (1) hour resistance rating.
- √ Per NFPA 96, range hoods, duct systems, grease removal devices and fire extinguishing equipment must be provided. *In home economics instruction spaces, faculty lounges, etc. where small residential-type ranges are installed, residential-type hoods mechanically exhausted to the outside may be used.*

14.3 General Requirements

14.3.6 Sprinklers

Sprinkler Systems must be installed in accordance with NFPA 13 and NFPA 75 in school facilities and buildings with more than two (2) stories or if required due to rated occupancy.

14.4 Fire Prevention

14.4.1 Housekeeping

- Child-prepared artwork and teaching materials may be attached directly to walls, but may not exceed **20 percent** of the wall area.
- All areas need to be kept free of trash and combustibles.
- Oily rags should be placed in covered containers and emptied daily.
- Spills of flammable/combustible materials must be cleaned up **immediately** using proper equipment and materials.

14.4.2 Flammables

- Must be stored in well-ventilated areas to avoid vapor build up.
- Are to be kept away from flames and sparks.
- Need to be transported in approved safety cans and stored in a **flammable** safety cabinet.
- Containers are to always be bonded and grounded when transferring from another container to avoid static build up.

	Flammable Class			Combustible Class	
Container	**IA**	**IB**	**IC**	**II**	**III**
Glass	**1 pt**	**1 qt**	**1 gal**	**1 gal**	**5 gal**
Metal or Approved Plastic	**1 gal**	**5 gal**	**5 gal**	**5 gal**	**5 gal**
Safety Cans	**2 gal**	**5 gal**	**5 gal**	**5 gal**	**5 gal**
Polyethylene	**1 gal**	**5 gal**	**5 gal**	**60 gal**	**60 gal**

14.4.3 Electrical

- Examine electrical cords for breaks and fraying.
- Use properly rated fuses and circuit breakers.
- Check equipment for overheating.

See the *Electrical Safety Section* of this Plan for additional information.

14.4 Fire Prevention - Continued

14.4.4 Welding and Torch Operations

- Work is not to be done in areas where open flames are not normally permitted, such as in areas or on equipment where oxygen, flammable gases or liquids or chemical vapors may be present.
- Areas need to be clear of combustible materials or covered with flame retarding material.
- A fire extinguisher needs to be kept in the welding area and a firewatcher assigned if welding or cutting in an elevated area or in an area where a fire may occur.

See the *Welding Safety Section* of this Plan for additional information.

14.4.5 Paint Spray Booth Operations

14.4.5.1 Location and Installation

- Spray booth installation must meet the requirements of *NFPA 33*.
- No other operations are to be conducted within three feet of the spray booth.

14.4.5.2 Ventilation

- Mechanical ventilation capacity must equal at least 100 cubic feet per minute (CFM) times the total area of booth openings. It must be capable of maintaining the concentration of vapors below 25% of the Lower Flammable Limit (LFL).
- Filter pads are to be installed to prevent excessive accumulation of deposits in ducts and discharge of residue through duct outlets.
- A gauge and audible alarm is to be installed to indicate that air velocity is maintained.

14.4.5.3 Fire Protection

- *NO SMOKING, WELDING or OPEN FLAMES* signs are to be posted in the vicinity of the spray booth.
- An automatic fire extinguishing system is to be installed per *NFPA 17* and *NFPA 33*.
- Fire extinguishers are to be installed adjacent to the spray booth in accordance with *NFPA 10* for high hazard locations.

14.4.5.4 Operation

- Solvents used for cleaning are not to have flash points below 100°F.
- Flammable/combustible liquids in the spray booth are not to exceed 10 gallons.
- Flammable/combustible liquids must be brought into the spray finishing area in original closed containers, approved portable tanks, or approved safety cans. OPEN CONTAINERS OR GLASS CONTAINERS MAY NOT BE USED!
- Spray areas and ducts are to be regularly cleaned and kept as free from accumulation of deposits as practical. Scrapers, spuds and tools used for cleaning must be non-sparking.
- All paint mixing is to be conducted in the spray booth with the ventilation system operating (personal protective equipment (PPE), as required by the Material Safety Data Sheet (MSDS), must be worn).

14.4.5.5 Inspections

- The fire suppression system is to be inspected **annually** by an outside contractor.
- The spray booth is to be inspected **monthly** to ensure compliance with all regulations.
- Filters are to be inspected **monthly** to determine if replacement is required.

14.5 Fire Extinguishers

14.5.1 Classification

Fire extinguishers are to be manufactured and marked with the appropriate symbols and/or pictograms designating the classes of fires on which they are to be used.

The four classes are:

Class A Ordinary Combustibles
Class B Flammable Liquids
Class C Electrical
Class D Combustible Metals

14.5.2 Requirements

Extinguishers must be:

1) Mounted properly, accessible within 75 feet of areas with the potential for class A fires and 50 feet for class B, and clearly identified;
2) Visually inspected **monthly** by qualified facility personnel and **annually** by a certified contractor;
3) Hydrostatically tested at the required interval;
4) Recharged and replaced after each use.

14.6 Fire Safety Inspectors

- Every building on each site within the School Board of Brevard County's jurisdiction must receive an **annual** comprehensive fire safety inspection.
- A Fire Safety Inspector certified by the State of Florida, Department of Insurance, and Division of the State Fire Marshal must conduct this inspection.
- Reports must be maintained on file in School Board offices.

14.7 Training

14.7.1 Fire Safety and Fire Extinguisher Use

All employees who might be expected to use fire extinguishers are to be trained **annually** in their selection and use per *OSHA 29 CFR 1910.157*. In addition, general information covering fire safety and prevention is to be covered as part of each department's new employee orientation

14.7.2 Paint Spray Booth Operators

Employees who perform paint spraying operations are to be trained in the potential safety and heath hazards, including operational, maintenance, and emergency procedures required.

14.8 Recordkeeping

14.8.1 Records Retention

Record	Maintained By	Retention
Inspections: Fire Suppression Systems Water Based	**Contractor**	**3 Years**
Inspections: Fire Suppression Systems Wet Chem. Hood	**Contractor**	**3 Years**
Fire Extinguisher Hydrostatic Tests	**Contractor/Environmental Health and Safety**	**Life of the Extinguisher**
Inspections: Annual Fire Extinguisher	**Contractor/Environmental Health and Safety**	**12 Months**
Inspections: Paint Spray Booth/Filters	**Environmental Health and Safety**	**3 Years**
Inspections: Annual Comprehensive Fire Safety Inspection Reports	**Environmental Health and Safety**	**4 Years**
Training	**Environmental Health and Safety/Fire College**	**Most Current**

Section 15: First Aid

15.1 First Aid Kits

First Aid kits are to be maintained at each location for treatment of minor injuries not requiring medical care. First Aid kits located in schools must remain under the

supervision of an adult but be made available to pupils at all times while school is in session. First Aid kits are to be inspected **monthly** and contain sufficient quantities and types of items necessary for routine first aid, in addition to a First Aid Manual or Instruction Guide.

Whenever an injury is treated, no matter how minor, it must be documented or reported to a principal or supervisor.

29 CFR 1910.151 **Chapter 64E-13.004 F.A.C.**

It is recommended that first aid kits contain at least the following items:

10 Packages Kit (5-9 Persons)

1 Pkg. Adhesive bandages, 1" (16 per pkg.)
1 Pkg. Bandage compress, 4" (1 per pkg.)
1 Pkg. Scissors and tweezers (1 ea. per pkg.)
1 Pkg. Triangular bandage, 40" (1 per pkg.)
1 Pkg. Antiseptic soap or pads (3 per pkg.)
1 Pair Latex gloves
5 Pkgs. Job Specific Items*

24 Package Kit (15-24 Persons)

2 Pkgs. Absorbent gauze, 24" x 72" (1 per pkg.)
2 Pkgs. Adhesive bandages, 1" (16 per pkg.)
2 Pkgs. Bandage compresses, 4" (1 per pkg.)
1 Pkg. Eye dressing (1 per pkg.)
1 Pkg. Scissors and tweezers (1 ea. per pkg.)
6 Pkgs. Triangular bandages, 40" (1 per pkg.)
1 Pkg. Antiseptic soap or pads (3 per pkg.)
3 Pair Latex gloves
9 Pkgs. Job Specific Items*

16 Package Kit (10-14 Persons)

1 Pkg. Absorbent gauze, 24" x 72" (1 per pkg.)
1 Pkg. Adhesive bandages, 1" (16 per pkg.)
2 Pkgs. Bandage compresses, 4" (1 per pkg.)
1 Pkg. Eye dressing (1 per pkg.)
1 Pkg. Scissors and tweezers (1 ea. per pkg.)
2 Pkgs. Triangular bandages, 40" (1 per pkg.)
1 Pkg. Antiseptic soap or pads (3 per pkg.)
2 Pair Latex gloves
7 Pkgs. Job Specific Items*

36 Package Kit (25-49 Persons)

4 Pkgs. Absorbent gauze, 24" x 72" (1 per pkg.)
2 Pkgs. Adhesive bandages, 1" (16 per pkg.)
5 Pkgs. Bandage compresses, 4" (1 per pkg.)
2 Pkgs. Eye dressings (1 per pkg.)
1 Pkg. Scissors and tweezers (1 each per pkg.)
8 Pkgs. Triangular bandages, 40" (1 per pkg.)
1 Pkg. Antiseptic soap or pads (3 per pkg.)
5 Pair Latex gloves
13 Pkgs. Job Specific Items*

NOTE: A CPR micro-screen should be included at each site.
***A sterile gel-soaked burn dressing is recommended for kitchen first aid kits and any other departments where burns are a potential hazard.**

15.2 First Aid Providers

Employees trained and certified in First Aid/CPR are to be available on each shift at each location to render first aid in an emergency if a medical infirmary, hospital or treatment facility is not nearby or reachable within 4-6 minutes.

15.3 Recordkeeping

15.3.1 Records Retention

Record	Maintained By	Retention
Inspection Records*	Principals or Facility Managers	12 months
First Aid/CPR Training/Certification	Environmental Health and Safety	Most Current
First Aid Log	Principals or Facility Managers	12 months

**See Monthly Inspection Report*

Section 16: Food Service Safety

16.1 Introduction

Food service employees may be exposed to potential hazards throughout the day while working in School Board of Brevard County cafeterias. This Section identifies the typical hazards that are found in a food service environment along with the precautions that must be taken to ensure employee safety while performing food service work.

General Duty Clause - OSH Act 5(a)(1) **"Serving It Safe: A Manager's Tool Kit" National Agricultural Library, USDA**

16.2 Common Hazards

16.2.1 Typical hazards in the Food Service environment may include:

1) Burns
2) Cuts, abrasions
3) Electrical shock
4) Falling objects
5) Hazardous chemicals
6) Slips, trips and falls
7) Strains

16.3 Safe Work Procedures

16.3.1 Burns

Burns can result from contact with hot surfaces, such as grills, ovens, burners, fryers and other heating equipment. They can also be caused by escaping steam, or by hot food or drinks that are splattered, splashed or spilled.

16.3.1.1 To Prevent Burns:

- Use thick, dry potholders or mitts. Stir food with long-handled spoons or paddles.
- Turn on hot water faucets cautiously. Wear insulated rubber gloves for rinse water that is 171°F or greater.
- Follow instructions for the use of cooking equipment – particularly steam equipment. Be sure all steam is expelled from steamers before opening the door.
- Lift cooking lids and similar equipment away from yourself to avoid burns from steam.
- To avoid splattering and splashing, don't fill kettles too full. Do not allow food to boil over.

16.3.1 Burns - Continued

16.3.1.1 To Prevent Burns – Continued:

- Make sure that food is DRY before placing it in a fryer. OIL AND WATER DO NOT MIX.
- Point pan handles away from traffic, but within reach, to avoid knocking over other pans.
- Do not crowd cooking surfaces with hot pans.
- Remove cooked foods from cooking surfaces immediately.
- Allow oil to cool and use extreme caution when cleaning fryers.
- Use caution when removing hot pans from ovens. Wear insulated gloves or mitts, and be certain no one is in the removal path.
- Do not wear clothing that may drape onto a hot spot and catch on fire.
- Do not run cords under carpeting.

16.3.2 Cuts and Abrasions

Food service employees are exposed to knives, sharp edges of equipment and supplies, grinding and slicing equipment and broken glass. All of these could potentially cause injuries from cuts and abrasions.

16.3.2.1 To Prevent Cuts and Abrasions:

- Use the appropriate tools (not bare hands) to pick up and dispose of broken glass. Place broken glass into a separate clearly marked garbage container.
- Take care when cutting rolls of kitchen wrap with the cutter.
- Be careful with can openers and the edges of open cans. Never use a knife to open cans or to pry items loose.
- Us a pusher to feed food into a grinder.
- Turn off and unplug slicers and grinders when removing food and cleaning.
- Use the guards on grinders and slicers.
- Replace equipment blades as soon as they are cleaned.

- Keep knives sharp. Dull blades are harder to work with and cause more cuts then sharp ones.
- Never leave knives or equipment blades in the bottom of a sink.
- Carry knives by the handle with the tip pointed away from you. NEVER TRY AND CATCH A FALLING KNIFE.
- Cut away from yourself on a cutting board.
- Store knives and other sharp tools in a special place when not in use.
- Wash dishes and glasses separately to help prevent them from being crushed by heavier objects and breaking in the dishwasher or sink.
- Do not stack glasses or cups inside one another.
- Watch out for nails, staples, and protruding sharp edges while unpacking boxes and crates.

16.3.3 Electrical Shock

A variety of electrical equipment is used in food service, and if not maintained and used properly, employees could be exposed to the hazard of electrical shock.

16.3.3.1 To Prevent Electrical Shock:

- Never use equipment with frayed or damaged cords.
- Do not plug multiple electrical cords into a single outlet.
- Ensure that all electrical equipment is properly grounded.
- Do not use extension or power cords that have the ground prong removed.
- Ensure that all electrical outlets, receptacles or openings are covered.
- Ensure that employees can reach switches without touching or leaning against metal tables or counters.
- Use electrical equipment only when hands are dry.
- Unplug equipment before cleaning.
- Locate electrical switches and breakers to permit rapid shut down in the event of an emergency.

16.3.4 Falling Objects

Food Service employees and others, who may be in areas where equipment is stored, could be struck by falling objects if materials are not properly secured.

16.3.4.1 To Prevent Objects from Falling and Striking Employees (and others):

- Materials and equipment (cafeteria tables, chairs, etc.) must be stored so that they do not create a hazard. Containers, bags, etc. stored in tiers must be stacked, blocked and limited in height so that they are stable and secure.
- Round objects need to be blocked or secured to prevent rolling.

16.3.4.1 To Prevent Objects from Falling and Striking Employees (and others) - Continued:

- Materials are not to be stored on top of cabinets, lockers, etc., unless secured.
- Store heavier objects on lower levels; do not overload shelving and cabinets or exceed their rated capacity.
- Cartons that could be affected by moisture need to be stored on platforms.

16.3.5 Fires

Knowledge of fire prevention measures are essential in a Food Service environment since more fires occur in food service than in any other type operation.

16.3.5.1 To Prevent Fires and Protect Employees:

- Fire extinguishers of the appropriate size and classification must be available in all areas where fires are likely such as in areas where grills and deep fryers are operated.
- Fire extinguishers must be properly identified, mounted outside the area where the fire is likely to occur and readily accessible. (within 25 feet.)
- Employees who are required to use extinguishers must be properly trained.
- Fire extinguishers must be visually inspected monthly and an annual maintenance check performed and documented.
- Smoking is allowed only in designated areas.
- Employees must be familiar with evacuation routes and procedures.
- Avoid the accumulation of combustible materials such as boxes, crates, pallets, etc.
- Store flammables in a well-ventilated area away from heat sources.
- Investigate burning odors **immediately**.
- Fixed extinguishing systems must be inspected annually to ensure good operation.
- Filters and hoods over ovens must be cleaned periodically to prevent grease and dust accumulation.
- THE FIRE DEPARTMENT MUST ALWAYS BE CALLED BEFORE FIRE FIGHTING IS INITIATED.

Food Service employees must be protected from improper exposure to hazardous chemicals such as cleaning agents, chemical pesticides, and chemical sanitizers that could cause injury or illness.

16.3.6.1 To Prevent Exposure to Hazardous Chemicals:

- A list of hazardous materials (Chemical List) must be maintained and all other applicable requirements as shown in Section 3.2 of the *Chemical Safety Section* of this Plan must be met.
- Only properly trained employees may handle hazardous chemicals.
- Employees must read the Material Safety Data Sheet (MSDS) for each chemical they use.
- The level of personal protective equipment (PPE) indicated by labels and MSDSs must be worn.
- Non-porous gloves and eye protection should be worn when working with sanitizing agents and other cleaners.
- Store chemicals in original containers away from food.
- Wash hands thoroughly after working with chemicals.
- Limit access to chemicals to authorized personnel.
- Make sure labels clearly display chemical hazards.

16.3.7 Slips, Trips and Falls

Wet surfaces and tripping hazards can create unsafe conditions in areas where food preparation and cleanup operations are conducted. It is important that proper preventative measures be taken to protect employees from such unsafe conditions.

16.3.7.1 To Prevent Slips, Trips and Falls:

- Clean up wet spots and spills **immediately.**
- Let people know when floors are wet. Use signs that signal caution and prominently display them.
- Wear low-heeled shoes with non-slip soles.
- Remove boxes, trash and equipment from walkways and passageways.
- Keep aisles clear of obstructions, slipping and tripping hazards, etc.
- Ensure that rugs lie flat and are slip-resistant.
- Use handrails when ascending or descending stairs.
- **NEVER** string cords or wires across the floor.
- Use caution when stepping into aisles thru doors. **BE ALERT!**
- When using two-way doors, avoid striking other people approaching from the opposite direction. **OPEN DOORS SLOWLY!**
- Use a ladder or step stool to retrieve items out of reach. **NEVER STAND ON FURNITURE!**
- Never block your view by carrying large items. Use a hand truck or carry smaller loads.

16.3.8 Strains

Materials and equipment used in food service can be heavy or unwieldy. Good work practices are necessary to prevent muscle sprains and injuries.

16.3.8.1 To Prevent Strains:

- Store heavy items on lower shelves.
- Use dollies or carts when moving objects that are too heavy to carry.
- To move objects from one area to another, use carts with firm shelves and properly operating wheels or casters.
- Do not carry too many objects at one time. Use a cart.
- Do not try to lift heavy objects by yourself.
- Use proper lifting techniques. Remember to bend from our knees, not your back.

16.3.8.2 To lift an object off the ground, use the following steps:

1) Make sure you have good footing and set your feet about 10 to 15 inches apart. It may help to put one foot in front of the other.
2) Assume a knee-bend or squatting position, keeping your back straight and upright.
3) Get a firm grip and lift the object by straightening your knees -- **not your back**.
4) Carry the load close to your body (not on extended arms).
5) To turn or change your position, shift your feet, don't twist your back.
6) *Reverse the steps to set an object on the ground*.

16.4 Recordkeeping

16.4.1 Records Retention

Record	Maintained By	Retention
Inspection Records*	Principals or Facility Managers	12 months
Training	Environmental Health and Safety	Most Current
Inspections: Fire Suppression Systems Water Based	Contractor	3 Years
Inspections: Fire Suppression Systems Wet Chem Hood	Contractor	3 Years
Fire Extinguisher Hydrostatic Tests	Contractor/Environmental Health and Safety	Life of the Extinguisher
Inspections: Annual Fire Extinguisher	Contractor/Environmental Health and Safety	12 Months

**See Monthly Inspection Report*

Section 17: Groundskeeping

17.1 Introduction

School Board of Brevard County employees use a variety of powered equipment to maintain outdoor areas. This may include mowers, chain saws, trimmers and a variety of other lawn and/or yard maintenance equipment. In order to avoid accidents and injuries the following safety rules must be followed.

State Requirements for Educational Facilities Chapter 482, Florida Statutes

17.2 Responsibilities

17.2.1 Principals, Facility Directors and Supervisors Must:

- Ensure that only **trained and authorized** employees use equipment.
- Provide the proper equipment for the job.
- Ensure that employees have access to the manufacturer's operating manuals or instructions.

17.2.2 Employees Must:

- Receive training for all equipment that they are authorized to use.
- Read and comply with the instructions given in the manufacturer's operating manuals.
- Operate the equipment safely and comply with all safety rules, including those in this Section.

17.3 Equipment - Safe Work Practices

17.3.1 All Equipment

- Read the manufacturer's instructional manual before operating any equipment.
- Ensure that you are trained to use the equipment - DO NOT use equipment that you do not feel you are qualified to operate.
- Inspect all equipment priors to use to ensure that it is safe to use.
- Ensure that servicing or maintenance is completed per the manufacturer's recommendations.
- Never use defective equipment - tag "OUT OF SERVICE."
- Never wear loose clothing or jewelry and keep hair tied back when operating equipment.
- Wear a fluorescent orange safety vest when working near streets or roadways, etc.
- Keep bystanders out of the work area (within 50 feet) if flying objects could strike them.
- If cutting limbs or trimming trees from an elevated position, block off a work zone so people cannot enter the area and be struck by falling debris.
- Never operate equipment when you are under the influence of drugs or alcohol or taking medication (either prescription or over-the-counter), which may make you drowsy.
- Never work with electric power tools in wet or damp conditions.
- Use a ground fault circuit interrupter (GFCI) with electrical equipment.
- Make sure that extension cords are in good condition, rated for outdoor use and the same size as the cord you plug into it.
- If you need to clear a jam or make adjustments near moving parts on any equipment, disconnect it if it is electric and if it is gasoline-powered, disconnect the spark plug wire(s).
- Turn off all tools if left unattended, even if only for a short time.
- Handle gasoline carefully, make sure equipment is off and cool before filling and wipe up spills **immediately**. NEVER SMOKE WHEN REFUELING!

17.3.2 Mowers and Mulchers

- Remove any visible loose rocks, sticks, etc., before mowing.
- To remove debris from a clogged discharge chute: stop the mower, disconnect the spark plug and use a stick or piece of wood.
- If using a grass catcher, stop the mower and let the blade stop before removing or attaching the bag.
- Stop the mower engine before making wheel adjustments.
- Wear hearing protection, safety glasses or goggles and safety shoes when operating any mower.
- Keep the blade sharp for best performance.
- Never remove safety decals or by-pass safety devices such as the kill switch.
- Ensure that the drive clutch is disengaged when starting a self-propelled mower.
- NEVER STAND IN FRONT OF A SELF-PROPELLED MOWER!
- Avoid pulling the mower backward to reduce the chances of your feet being caught in the blade area.
- On a riding mower, do not mow in reverse unless absolutely necessary and ONLY if you are certain that no one is behind you. If you must back up, disengage the blade and look at the area behind you.
- When mowing slopes with a walk-behind mower, mow across the face of the slope, not up and down. If using a ride-on mower, mow up and down on low slopes (5°-15°) only; avoid mowing excessively steep slopes. (>15° or a 27% grade.)
- Avoid mowing too close to a ditch, on steep hills, or any terrain where you could lose control of the mower.
- NEVER ALLOW PASSENGERS ON RIDE-ON MOWERS OR TRACTORS; OPERATORS MUST SIT IN THE SEAT UNLESS IT IS INTENDED TO BE OPERATED STANDING UP.

17.3.3 Chain Saws

- Avoid “kickback”. Never cut with the tip of the guidebar, keep your body out of the line of cut and cut with your left arm straight and with a firm grip. Use saws with an anti-kickback device mounted on the tip of the guidebar if possible.
- Start cutting only after you have a clear work area and secure footing.
- Use safety shoes, safety glasses or goggles, hearing protection and a hard hat when operating a chain saw.
- Wear non-slip gloves for a better grip.
- If operating an electric chain saw, use an extension cord for outdoor use.
- Ensure that the saw’s chain stops when the throttle control lever is released.
- Never cut above shoulder height with a chain saw.

- To avoid being struck when cutting limbs under tension, be alert for spring back.
- Always bring the saw up to speed before applying the chain to the wood - maintain a steady speed.
- Cut while standing slightly to the side, out of the plane of the cutting chain and guidebar, to reduce injuries due to loss of control.
- Do not operate a chain saw in a tree or from a ladder unless you have been trained and are properly equipped to do so.
- Maintain proper saw chain tension. Loose chains can come off the guidebar and strike the operator.
- If transporting a chain saw in a vehicle, keep the chain and bar covered with a guard and secure to prevent movement.

17.3 Equipment - Safe Work Practices - Continued

17.3.4 Leaf Blowers

- Wear hearing protection and safety glasses when operating.
- Wear a dust mask if a large quantity of dust is generated.
- Point away from people.
- Allow engine to cool before storing.

17.3.5 Hedge Trimmers

- Keep both feet on the ground when operating.
- Do not overreach during operation; maintain your balance.
- Never trim hedges higher than shoulder height.
- Keep fingers away from the trimmer blades; turn off before clearing trimmings from the blade.
- Wear hearing protection and safety glasses when operating.
- Wear a dust mask if a large quantity of dust is generated.
- Point away from people.
- Allow engine to cool before storing.

17.3.6 Lawn Edgers

- Remove any rocks, branches and debris from the area you will be edging, if possible.
- Make sure blade is firmly attached.
- Watch for people in area (within 50 feet), avoid using the edger if by-standers could be hit by flying objects.
- Wear safety glasses and a dust mask if a large quantity of dust is generated.
- Keep the blade above ground when starting.
- If edging along roadway, keep as close to the curb as possible.

- Do not use on graveled surfaces.
- If you strike a foreign object, stop operations, disconnect the spark plug and inspect for damage.
- Point away from people.
- Allow engine to cool before storing.

17.3.7 String Trimmers

- Wear hearing protection and safety glasses when operating.
- Wear safety shoes, work gloves and other appropriate clothing.
- Keep string head below waist level.

17.3 Equipment - Safe Work Practices - Continued

17.3.7 String Trimmers - Continued

- Keep a firm footing, do not overreach.
- Use only for weeds and grass, string trimmers are not designed for shrubbery or other greenery growing above ground level.
- Point away from people.

17.3.8 Chippers

- Wear hearing protection, safety glasses and work gloves when operating.
- Do not feed branches or limbs longer than 6 feet into a chipper.
- Stand to the left or right side of the hopper when feeding materials into the machine.
- Feed the stump or stalk end into the chipper first.
- If you must make adjustments to the discharge chute or clear a jam, turn the switch to the “off” position.
- Use chocks to prevent movement.

17.4 Spraying Operations

17.4.1 Fertilizer, Herbicides and Pesticides (Small Quantities)

- Employees must be trained if spraying herbicides and pesticides.
- School employees who apply pesticides must either:
  - √ Obtain a limited certificate in structural pest control (if applying pesticides indoors), or lawn and ornamental pest control (if applying pesticides outdoors);
  - √ Use only “ready-to-use” pesticides purchased over the counter at retail (not provided by wholesalers of pesticides);

- √ Operate under a fully certified pest control operator employed by the school district.

- Spraying equipment must be inspected prior to each use for leaks, loose parts, etc.
- Defective equipment needs to be tagged "OUT OF SERVICE" and not used until repairs have been made and it has been re-inspected.
- Inspect areas for tripping hazards and remove or identify with markings.
- NEVER transfer fertilizers into unlabeled containers.
- Alter the spray pattern by spraying in a left to right motion. Keep spray off feet and legs.
- Spray in a direction that will prevent drift from overhead spraying.
- NEVER smoke or carry smoking materials while handling or spraying from containers labeled "HERBICIDES" or "PESTICIDES".
- After spraying operations, remove all work clothes and shower before going home. Wash pesticide/herbicide clothes separately from other clothing.
- If clothing is saturated, remove **immediately** and dispose of in metal containers labeled "PESTICIDE CLOTHING".
- Do not mix fertilizers with gasoline or cleaning agents.
- Store fertilizers in cool, dry places designated and posted "FERTILIZER STORAGE".
- Read and follow the Material Safety Data Sheet (MSDS) and instructions on the labels for fertilizers, pesticides or herbicides.
- Use the appropriate Personal Protective Equipment (PPE) as indicated by the MSDS.
- Keep containers closed when not in use.
- Carry fresh water and soap in service vehicles.
- Always wash hands and arms with soap and water after operations and before eating or drinking.
- Do not spray herbicides or insecticides on rainy or windy days.
- Replace the injector with the attached shield when not in use.
- Never carry herbicides or pesticides on your shoulder.
- Do not transport pesticide containers in the cab of a vehicle.
- Do not store pesticides near hot lamps, in direct sunlight or near heat.
- Only mix chemicals in an area with good ventilation. The area must be posted "CHEMICAL MIXING AREA". Rinse containers a minimum of three times with water after each use.

A Job Hazard Analysis for the above work procedures should be completed.

17.5 School Sites

17.5.1 Vegetation

- Trees on the site must be healthy and disease free.
- No poisonous, toxic and/or hazardous plants may be on the site.
- A program must be in place to remove all invasive non-native plants such as:
  - √ Punk tree (Melaleuca Quinquenervia)
  - √ Brazilian Pepper (Schinus Terebinthifolius)
  - √ Australian Pine (Casuarina-equisetifolia)
  - √ Catclaw Mimosa (Mimosa Pigra)

17.6 Recordkeeping

17.6.1 Records Retention

Record	Maintained By	Retention
Manufacturer's Operating Instructions and Manuals	**Facility Administration**	**Duration of Equipment Use**
Training	**Environmental Health and Safety Office**	**Most Current**

Section 18: Hazard Recognition

18.1 Introduction

It is important for School Board of Brevard County employees to understand and recognize unsafe situations when they develop, unsafe conditions that may be present and hazards that they may be exposed to while completing their work. A Job Hazard Analysis and Hazard Recognition Program need to be established in order to give employees the guidelines and information they will need in order to not only recognize hazards and report them, but also to reduce and/or eliminate them. *These programs are a key component in developing a safety program and all employees need to be involved in the process!*

18.2 Responsibilities

18.2.1 Job Hazard Analyses (JHAs)

18.2.1.1 Management

- Assign completion of JHAs to employees; provide forms, information and training.
- Set a time line for completion and ensure completion by the target date.
- Review JHAs to ensure accuracy and return for revisions, if necessary.
- Supervisors or the Safety Coordinator needs to review Job Hazard Analyses **at least annually** and ensure that revisions are made and affected employees informed of any changes.

18.2.1.2 Employees

- Complete JHAs as assigned.
- Inform management of changes in equipment, procedures or environment that may affect hazard exposures so that JHAs can be revised.

18.2.2 Hazard Recognition Program

18.2.2.1 Management

- Provide employees Hazard Recognition Forms and information.
- Review reports and provide feedback to employees.
- Initiate corrective actions for safety-related issues and unsafe conditions **immediately**. High hazard conditions are given priority.

18.2.2.2 Employees

- Report unsafe conditions using the Hazard Recognition Form.

18.3 Job Hazard Analysis

Job Hazard Analysis (JHA) is an important tool that is used to identify hazards and eliminate or minimize them through the use of protective measures or changes in the work process. They are essential as a tool for new employee training and to provide hazard recognition and abatement training for those who complete them.

All employees should complete JHAs for the jobs or work that they do in order to increase their overall safety awareness.

18.3.1 Process Steps

- **Step One:** *Break the job down into steps*.
  Example:
  1) Pick up box
  2) Place on hand truck

- **Step Two:** *Identify the hazards and/or potential danger associated with each step*.
  Example:

1) Back strain
2) Dropping object, pinch points -striking body part

- **Step Three:** *Identify preventive actions to eliminate or reduce the hazard*.
  Example:
  1) Use proper lifting technique and a back supporter or store items at a level between shoulders and knees and move onto a cart at the same level, eliminating the need to lift.
  2) Ensure that you have a good grip, wear work gloves and safety shoes.

18.3.2 General Rules

- Use a ***numbering system*** to connect each step to the hazard and the associated preventive measures:

STEP	HAZARD (Chemical)	TOOLS	PROTECTION	REVISION/DATE
1. Lift Box	1. Strains		1. Training, Proper Lifting	
2. Place on Hand Truck	2. Dropping, Pinching	2. Hand Truck	2. Work gloves, Safety Shoes	

- Use a priority system. Select those jobs where there is a high potential for injury, a high frequency rate for accidents or new jobs where hazards have not yet been identified.
- Break the job down sequentially. First step, second step, etc.
- Avoid too much or too little detail. Focus on major steps with potential for the most harm.
- Complete the JHA during the actual performance of the work to ensure no steps are overlooked.
- List ***all*** hazards, including health hazards. List specific chemicals or tools used as well. Use the following chart as a guideline:

Sources of Hazards	
a)	Sources of motion, machinery where movement of tools, machine elements, or particles could exist, or movement of personnel that could result in collision with stationary objects;
b)	Sources of high temperatures, could cause burns, eye injury, ignition of protective equipment, etc.;
c)	Types of chemical exposures;
d)	Sources of harmful dusts;
e)	Sources of light radiation, welding, brazing, cutting, furnaces, heat treating, high intensity lights, etc.
f)	Sources of falling, rolling objects, potential for dropping objects;
g)	Sources of sharp objects which might pierce the feet or cut hands;
h)	Sources of rolling or pinching objects which could crush the feet;
i)	Layout of workplace, location of co-workers;
j)	Electrical hazards.
k)	Jobs requiring body movement, force, exertion, etc.

Hazard Categories	
a)	Impact
b)	Penetration
c)	Compression (roll-over)

d)	Chemical
e)	Heat
f)	Harmful dust
g)	Light (optical) radiation
h)	Ergonomic

- Consider all preventative actions such as:
  - Engineering the hazard out; (ventilation, mechanical assistance, etc.)
  - Providing job instructions or training; (Chemical safety, inspection techniques, operating procedures, housekeeping, etc.)
  - Providing personal protective equipment. (PPE)

It is critical that a recommended preventative action or procedure be provided for every hazard.

- ***Correct serious hazards as soon as possible***.

- **Job Hazard Analyses** should be retained until the hazard no longer exists and reviewed **annually**, unless there is a procedure or equipment change. If it is necessary, revisions should be made and affected employees informed of the changes.

18.4 Hazard Recognition Program

In order to protect themselves and their co-workers, employees need to be provided a system for reporting unsafe conditions, equipment or work practices. The goal is to provide a safer workplace by allowing those most familiar with the work an opportunity to identify hazards that may not be readily apparent to management or supervision.

18.4.1 General

- Supervisors are to encourage employees to report unsafe conditions and assure them that the program will not be **used as a disciplinary tool**.
- Hazard Recognition Forms need to be provided in accessible areas of each work location for the use of all employees.

- Employees who observe unsafe conditions, equipment or work practices need to complete a form and submit it to supervision for review.

Review the hazard chart in the previous section for types of hazards to report.

- Submitted forms need to be reviewed by the principal or supervisor in a **timely manner** and a response provided to the employee who submitted the report.
- Extremely hazardous conditions need to be corrected **immediately**.
- The Site Safety Committee is to be given copies of all Hazard Recognition Forms.
- School Board employees need to be informed of any procedural changes.
- Forms must be maintained on file for **1 year** for review.

18.4.2 Hazard Recognition Procedure

1) Employee completes the Hazard Recognition Form and submits to his/her principal or supervisor.
2) The principal/supervisor reviews and determines if further action is necessary. (He/she may submit to Site Safety Committee for determination.)
3) Corrective actions are initiated.
4) If an extremely hazardous condition, corrective actions are initiated **immediately**.
5) Employee receives feedback section of the report from supervisor.
6) Employees are informed of procedural changes via communication processes.
7) Hazard Recognition Form is filed for **1 year**.

18.4.3 Form (See the *Forms Section* of this Plan)

Hazard Recognition Form

Location_____ Name _____
Date_____

1. Unsafe Condition, Equipment, Tool, Act, etc.

2. Suggestions for Corrective Action

To Be Completed by Principal/Supervisor or Safety Committee

3. Response

☐ **Not Safety Related** ☐ **Corrective Action Taken** ☐ **Pending for Further Review**

Action(s) Taken

☐ **Employee Informed of Response**

Date:_____ **By:**_____

Retain 12 Months

18.5 Recordkeeping

18.5.1 Records Retention

Record	Maintained By	Retention
Job Hazard Analysis	**Principals, Facility Supervisors and Environmental Health and Safety Office**	**Most Current**
Hazard Recognition Forms	**Principals and Facility Supervisors**	**12 Months**
Training	Environmental Health and Safety Office	**Most Current**

Section 19: Hazardous Waste

19.1 Introduction

All School Board of Brevard County locations that generate, handle, store or dispose of hazardous waste must comply fully with the Federal regulations governing such activities. These regulations have been adopted by the State of Florida and the Florida Department of Environmental Regulation enforces them. This Section of the Safety and Health Plan establishes guidelines for all facilities to follow in order to ensure compliance.

EPA 40 CFR Parts 262-265 **DOT 49 CFR Parts 171-179**

19.2 Definitions of Waste

- ***Solid Waste*** is any garbage, refuse or sludge or any solid, liquid, semi-solid or contained gaseous material which is:
  - √ Being discarded;
  - √ Has served its intended purpose;
  - √ A manufacturing by-product.

- ***Hazardous Waste*** is any solid waste that may cause a substantial hazard to human health or the environment when improperly managed.

  Wastes are considered hazardous if:
  - √ They are ignitable liquids (Flashpoint <140^{o}F);
  - √ They are corrosive liquids (pH $\leq$2 or pH $\geq$12.5);
  - √ They are unstable, explosive or react violently with water;
  - √ They contain defined quantities of heavy metals or other specific toxic chemicals.

- **Empty Containers** that previously contained hazardous materials or wastes are considered hazardous waste unless:
  - √ They contain <1 inch of residue;
  - √ If the container is ≤110 gallons, residue must be <3% of total capacity;
  - √ If the container is >110 gallons, residue must be <0.3% of total capacity.

Containers must be TRIPLE rinsed if they previously held acutely hazardous waste.

Compressed gas cylinders containing hazardous waste with pressure approaching atmospheric, are considered hazardous waste.

19.3 Generators - Regulated by the EPA

- **Very Small Quantity Generators (VSQG) -** Those who generate <220 pounds of hazardous waste per month.
- **Small Quantity Generators (SQG) -** Those who generate >220 pounds but <2200 pounds of hazardous waste per month.
- **Large Quantity Generators (LQG) -** Those who generate >2200 pounds of hazardous waste per month.

Requirements and Limitations Based on EPA Status

EPA Status	Hazardous Waste Accumulation Limit			Requirements		
	Time/Days	Volume in Tanks	Volume in Containers	Accumulation Area	Emergency Preparations	Employee Training, Contingency Plan, Annual Report
LQG	90	No limit	No limit	Yes	No	Yes
SQG	180	6,000 (KG)	2,000 (KG)	Yes	Yes	No
VSQG	180	600 (KG)	600 (KG)	Yes	Yes	No

All generators must establish a Hazardous Waste Management Program that includes the following:

1) Notify EPA and FDEP that hazardous wastes will be generated.
2) Obtain EPA Identification Number if transporting, treating, storing or disposing of hazardous waste.
3) Conduct a site audit in order to develop a list of hazardous wastes and consider compatibility of various wastes.
4) Set up location of hazardous waste storage and place warning signs.
5) Obtain MSDS for each known or expected material from which wastes will be generated.
6) Establish proper handling, storage and disposal practices.
7) Establish Waste Minimization Program.
8) Set up training program for employees.
9) Implement the Hazardous Waste Management Plan.

19.4 Storage

19.4.1 Accumulation Area - space set aside for storing hazardous waste.

- Restrict access to only those employees trained and authorized to enter the area.
- Keep wastes away from traffic patterns; maintain 30-inch aisles for access.
- Mark the site clearly with "**Hazardous Waste Area**" signs.
- Have a spill kit, appropriate for the materials on hand.
- Where flammable wastes are stored, maintain a fire extinguisher within 25 feet.
- If corrosive wastes are stored, an eyewash and safety shower must be provided.
- Materials must not be stored on site past the EPA allowable limits. (See part 19.3 above)
- Use as small a container as possible.
- Containers must be in good condition, free of leaks, bulges, dents and/or severe rust. Replace or place in an over pack, if defective.
- Container material or liners must be compatible with the type of wastes stored in it.
- Containers must be kept closed when not being filled or emptied.
- Containers must be properly marked "**Hazardous Waste**" along with the date when waste was first put in the container.
- A warning sign must be posted, for example, "**Flammable Waste, No Smoking or Open Flames**".
- Different waste materials must NEVER be mixed.
- Areas where containers are stored must be inspected **weekly** for signs of leaking materials and containers must be inspected for signs of deterioration.
- Dikes, berm or other means must separate incompatible hazardous waste containers.

Substances are incompatible if they produce heat, pressure, fire, explosion, violent reaction or toxic fumes and gases when mixed.

- Use secondary containment such as basins, berm, liners, etc. to hold hazardous materials that may be released.

Containment must:

Keep potential spills away from drains and navigable waters;
Hold at least 110% of the volume of the largest container or 10% of the volume of all containers, whichever is greater;
Be covered if outdoors, when possible.

19.4.2 Satellite Accumulation Area - Areas where small amounts of hazardous waste are temporarily stored, usually near the place they are generated.

- Drums/containers must be marked "**Hazardous Waste**".
- Mark with the date waste is first placed into container.

19.5 Identification of UNKNOWN Wastes

- Sample immediately to get lab analyses.
- Always store and treat unknown wastes as dangerous, until testing indicates otherwise.
- Label the container with the sampling date and "**Waste Pending Analysis**".
- Log in the date the material was discovered, date samples were shipped, etc.
- If it is a mixture and it is designated as a hazardous waste, manage it according to its most hazardous content and/or characteristics.

19.6 Waste Minimization

Waste minimization is any activity that reduces, eliminates or avoids the generation of waste at its source. Each site needs to set up a program to develop and initiate these activities.

19.6.1 Goals

- Prevention of the generation of waste, when possible.
- Reuse, recycling or lessening the impact of the generated waste on the environment.

19.6.2 Recycling

The following materials can be reclaimed and recycled.

1) Freon (CFCs)

- Freon and chlorofluorocarbons (CFCs) are used in refrigeration and cooling systems. They cannot be vented or evaporated into the air and must be reclaimed and recycled.
- Never mix different types of CFCs.
- Consider CFC-containing solvent a hazardous waste.

2) Used Fluorescent Tubes

- May contain mercury. ALL tubes should be considered hazardous unless testing indicates otherwise.
- Send to a mercury reclaimer or dispose of with a permitted hazardous waste treatment, storage or disposal (TSD) facility.

3) Used Fluorescent Light Ballasts

- Light ballasts are the electrical components at the end of fluorescent light fixtures under a metal overplate. This ballast has a small capacitor that may contain polychlorinated biphenyls (PCBs).
- Never disassemble.
- Recycle **intact** ballasts at an EPA-permitted facility.

If made prior to 1978, the light ballasts probably contain PCBs. If made after 1978, they should be marked "Non-PCB".

Leaking PCB ballasts must be managed as PCB waste and must not be recycled. They must be disposed of in accordance with the *Toxic Substances Control Act.*

Non-PCB ballasts may contain DEHP, which is classified as a human carcinogen.

4) Used Oil (non-hazardous unless mixed with hazardous waste.)

- Never discharge into sewers, drainage systems, septic tanks, surface or ground waters, or marine waters.
- Do not mix or co-mingle with solid waste that is disposed of in landfills or directly dispose of into landfills.
- Do not mix with hazardous substances.
- Do not use for road oiling, dust control, weed abatement or similar uses that could release used oil into the environment.
- Accumulate for recycling by licensed facility.

Oily wastes such as wastewaters, centrifuge solids, filter residues, sludge, bottom sediments, tank bottoms and absorbents (kitty litter, absorbent clay and organic absorbent material), which have come into contact with and been contaminated by used oil may be land filled if the amount is very small and resulted from an accidental release or minor leaks or spills from normal processes and if all FREE-FLOWING oil has been removed (items must not be SATURATED or LEAKING oil).

Oil filters must not be disposed of in a landfill unless the oil has been removed and the filters crushed and drained.

5) Batteries

- The following types of batteries must be recycled or disposed of by an EPA-permitted treatment, storage and disposal (TSD) facility:
  - √ Mercuric oxide dry cell batteries;
  - √ Rechargeable batteries;
  - √ Nickel-cadmium batteries (Cd);
  - √ Small sealed lead batteries (Pb).

19.7 Disposal and Shipment of Hazardous Waste

All School Board of Brevard County facilities should contact the Environment Health and Safety office to arrange disposal of hazardous waste.

- Hazardous waste can only be disposed of at an EPA- permitted treatment, storage and disposal (TSD) facility.
- All shipments of hazardous waste must be shipped and transported by trained personnel in compliance with the *Department of Transportation (DOT) 49 CFR Parts 171-180*.
- Hazardous Waste must be properly:
  Classified
  Identified with shipping name (if *"Waste"* does not appear in the proper shipping name, it should be added, preceding the Proper Shipping Name (PSN) selected)
  Labeled
  Packaged in a DOT-approved container
  Shipped with a *Hazardous Waste Manifest*
  Marked with:
  - √ Name and address of generator
  - √ Manifest document number
  - √ EPA waste number
  - √ EPA ID number
  - √ UN or NA#, if applicable
  - √ With warning paragraph "**Hazardous Waste: Federal Law prohibits improper disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency**".

19.8 Training

In addition the Hazardous Waste Operations and Emergency Response (HAZWOPER) training listed in the Emergency Response Section of this Plan for those who must respond to a chemical release, the following training is required:

- ***Handling Hazardous Materials (HM126F):*** required for those employees who load, unload, or handle hazardous materials/waste; for those who prepare hazardous materials for transportation; for those who are responsible for transporting hazardous materials; and for those who operate a vehicle used to transport hazardous materials per *DOT 49 CFR Parts 171-180*.

- ***Required****: Every* ***three*** *years*

- ***Training must include***:

  General awareness/familiarization with requirements of DOT standards;
  Marking, labeling and packaging procedures;
  Safety and emergency response;
  Function specific training.

Training must be documented and kept on file for three years.

19.9 Recordkeeping

Records Retention

Record	Maintained By	Retention
Inspections*	**Environmental Health and Safety**	**12 Months**
Training Records	**Environmental Health and Safety**	**Most Current**
Hazardous Waste Manifests	**Environmental Health and Safety**	**5 years**
Hazardous Waste Characterization Documents	**Environmental Health and Safety**	**5 years**

**See the Monthly Inspection Report*

Section 20: Hearing Conservation

20.1 Introduction

The School Board of Brevard County has developed the following Hearing Conservation Program in order to prevent permanent noise-induced hearing loss resulting from on-the-job noise exposure. This program complies with the requirements of the Occupational Safety and Health Administration's (OSHA) Occupational Noise Exposure Standard as well as the Brevard County School Board's policy to maintain a safe and healthy work environment.

20.2 Responsibilities

20.2.1 Principals and Facility Managers, or Their Designees Must:

- Notify the Environmental Health and Safety (EH & S) staff of noise complaints or potential noise hazards.
- Ensure that equipment or areas that are greater than or equal to the 85-dBA operating noise levels are properly labeled or posted with signs.
- Inform EH & S of changes in processes, materials or equipment that may alter noise exposures.
- Ensure that employees use and care for hearing protection devices (HPDs) properly.
- Ensure that employees wear hearing protection devices where such protection is required.

20.2.2 Environmental Health and Safety Must:

- Administer this Hearing Conservation Program.
- Conduct a workplace process and equipment noise evaluation to identify areas that are greater than or equal to the 85 dBA per 8-hour time-weighted average operating noise level.
- Identify through evaluations of employee exposure, which job classifications must be included in this Hearing Conservation Program.
- Determine if administrative or engineering controls are necessary and if so, what type will be used and how they will be implemented.
- Identify areas that must be posted with warnings that hearing protection is required.
- Ensure audiometric testing is provided as required.
- Provide training as required by this Program.
- Provide adequate hearing protection devices (HPDs) to exposed employees.
- Maintain all exposure evaluation and sound level measurement documentation.

20.2.3 Employees Must:

- Wear hearing protection devices (HPDs) as shown during training.
- Attend required hearing conservation training sessions.

20.2.4 Contracted Audiologist/Physician

- Perform audiogram evaluations.
- Maintain audiometric test records.

20.3 Noise Surveys

- The Environmental Health and Safety staff will perform noise monitoring with a designed sampling strategy. Identification of employees and job classifications for inclusion in the Hearing Conservation Program and to enable proper selection of hearing protection.
- Monitoring must be repeated when any changes occur in production, processes, equipment or controls that might render the hearing protection inadequate or require additional employees to be included in the program.
- Employees exposed at or above the action level (85 dBA TWA_8) will be notified of the results of the monitoring.

Job Classifications that have been identified as those with potential over exposure to noise are listed in the Site Specific Section.

Areas that have been determined to have sound levels that may exceed the allowable limits have been identified for each department and placed in the Site Specific Section.

20.4 Reducing Noise Exposure

High noise areas need to be evaluated for potential noise reduction if new techniques become available. Efforts to reduce noise exposure need to be ongoing.

- The following methods are used to reduce noise levels in the workplace and prevent over exposure to employees:

Engineering Controls:

Reduction of noise production at the source;
Proper design of new machines;
Modification of present machines;
Proper repair and upkeep of equipment;
Use of appropriate mufflers;
Use of vibration dampeners on machines;
Reduction of noise transmission;
Increased distances between noise and employees exposed;
Construction of barriers between noise source and employees exposed.

Administrative Procedures:

Job schedule changes;
Employee rotation.

Hearing Protection Devices:

Earplugs;
Earmuffs;
Sound Bands.

20.5 Communication

- Work areas with noise levels exceeding 85 dBA are to be posted with appropriate high noise warnings.
- A copy of *OSHA's Noise Conservation Poster (OSHA 29 CFR 1910.95)* must be posted.

20.6 Audiometric Testing

- An audiometric testing program must be established and managed by an audiologist meeting the requirements of *29 CFR 1910.95.*
- Baseline audiograms will be provided upon employment for employees whose job classifications are included in this Hearing Conservation Program.
- Audiometric testing will be provided **annually** after initial testing, to all such affected employees.

Employees, who experience a Standard Threshold Shift (STS) that is determined to be work related, will be informed in writing within 21 days.

20.7 Hearing Protection Devices (HPDs)

- HPDs must be provided at no cost to employees who are exposed to noise levels at or above the action level of 85 dBA, TWA_8. Hearing protection will be replaced as necessary.
- Only approved hearing protection devices (HPDs) may be used.
- Employees may select HPDs from a variety of suitable types provided by the School Board of Brevard County.
- Proper initial fitting and supervision of the correct care and use of HPDs will be provided.
- Hearing protection devices must reduce the noise level to an 8-hour TWA of 90 dBA or less.

20.8 Training and Information

- Information and training programs concerning the harmful effects of overexposure to noise and the methods to prevent overexposure are to be provided **annually** to affected employees.

  - √ The effects of noise upon hearing;
  - √ The purpose of hearing protection;
  - √ The advantages, disadvantages and attenuation of various types of HPDs;
  - √ The selection, fitting, use and care of HPDs; and
  - √ An explanation of the purpose of audiometric testing and a brief description of test procedures.

- **Information to be provided:**
  - √ A copy of *OSHA's 29 CFR 1910.95* must be made available to affected employees and a copy must be posted in the workplace.

20.9 Recordkeeping

20.9.1 General

Training, audiometric test records and exposure measurements must be maintained and provided upon request, to former employees, employees, or their representatives per *OSHA 29 CFR 1910.1020*.

- **A record of training must include the following**:
  - √ The name of the employee;
  - √ The date of the training;
  - √ The identity of the person performing the training;
  - √ A course agenda.

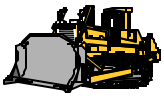
- **Audiometric test records must include**:
  - √ The name and job classification of the employee;
  - √ The date of the audiogram;
  - √ The examiner's name;
  - √ The date of the last acoustic or exhaustive calibration of the audiometer; and
  - √ The measurement of the background sound pressure levels in the test room.

20.9.2 Records Retention

Record	Maintained By	Retention
Exposure Measurements	**Environmental Health and Safety Office**	**2 years**
Audiometric Tests	**Contracted Audiologist/Physician**	**Duration of affected employee's employment**
Training	**Environmental Health and Safety Office**	**Most Current**

Section 21: Heavy Equipment and Fleet Services

21.1 Introduction



The use of heavy duty trucks, mobile cranes, tractors, bulldozers and other motorized equipment presents dangers to those who operate them, work near them or perform service and maintenance on them. Rollovers could injure the operator; co-workers could be struck or run over; and those performing service functions could be injured by equipment or tool failures, moving parts, etc. These accidents, which can cause serious injuries or even death, can be prevented with the use of extreme caution and safe work practices. The following procedures need to be followed by all employees who operate, maintain or work in the vicinity of such equipment.

29 CFR 1910.177 29 CFR 1910.244 29 CFR 1926.305 29 CFR 1926.441 29 CFR 1926.600-602 29 CFR 1926.1000-1003

21.2 Responsibilities

21.2.1 Principals and Facility Managers, or Their Designees

- Ensure that this equipment is operated only by those employees trained and authorized to do so.
- Ensure that those who service **multi-piece** and **single piece rim wheels** receive training before performing the work and are evaluated periodically for proficiency.
- Provide manufacturer's operating manuals and instructions, as well as rim charts, to employees.
- Provide equipment, tools and personal protective equipment (PPE), as necessary, to comply with the requirements of this Section.

21.2.2 Environmental Health and Safety Office

- Advise administrators and management of the safe work procedures in this Section.
- Assist in evaluating the performance of drivers/operators.
- Arrange for appropriate training.
- Compile and distribute equipment-related accident statistics.

21.2.3 Employees:

- Use the safe work procedures outlined in this Section as well as standard operating procedures developed by the School Board.
- Never perform work for which they have not been properly trained.
- Never use tools or equipment that are defective or unsafe.

Section 21: Heavy Equipment and Fleet Services

21.3 Fleet Maintenance and Servicing

21.3.1 Batteries and Battery Charging

Hazards including: acid burns, explosions or fires from hydrogen gas, and strains from lifting which could occur when out-of-vehicle recharging is done or when removing, replacing or servicing a battery.

- ***Storage Areas***
  - Are to be well-ventilated or have outside vents.
  - Are to have venting arranged to prevent fumes, gases or electrolyte spray from entering other work areas.
  - Racks and trays need to be substantial and resistant to electrolyte.
  - Floors need to be protected or have acid-resistant construction.

- ***Personal Protective Equipment***
  - Chemical goggles, a faceshield and rubber gloves are to be worn when working with batteries and acid-resistant aprons and rubber boots are to be used when filling.

- ***Safety Equipment***
  - An eyewash and safety shower must be provided within 25 feet of the battery handling area.
  - A dry powder or carbon dioxide fire extinguisher needs to be used to extinguish acid-created fires.
  - A neutralizer (baking soda) and running water needs to be available for emergency use.

- ***Charging Areas***
  - Battery charging installations are to be located in a designated area.
  - The charging apparatus is to be protected from damage by vehicles.
  - NO SMOKING or open flames is allowed in the battery storage or charging areas.
  - It is recommended that flooring be wooden and slatted for slip-resistance and to protect against electrical shocks during charging.
  - Manufacturer's instructions for charging rates must be followed to prevent generation of hydrogen.
  - Care needs to be taken to prevent arcing.

- Tools and other metal materials need to be secured so that contact with batteries is avoided (short circuits can cause burns or explosions).
- Batteries need to have vent caps that are in good condition and they are to be in place when charging to avoid electrolyte release.

- ***General***
  - Use care and if possible, mechanical hoisting devices when lifting batteries.
  - Spilled acid must be neutralized and washed down **immediately**.
  - If electrolyte gets on skin, flush with large quantities of running water and get medical assistance **immediately**.
  - If acid is splashed or gets in the eyes, irrigate with water for at least **15 minutes** and get medical assistance **immediately**.

Section 21: Heavy Equipment and Fleet Services

21.3 Fleet Maintenance and Servicing - Continued

21.3.2 Jacks

- Use the proper jack for the load - *it must be sufficient to lift and hold the load*.
- The rated capacity must be permanently marked on all jacks and not to be exceeded.
- If it is necessary to provide a firm foundation, the base needs to be blocked.
- If there is the possibility of slippage of the metal cap of the jack, a wood block needs to be placed between the cap and the load.
- After the load has been raised, it must either be blocked or otherwise secured **immediately**.
- Hydraulic jacks exposed to freezing temperatures must be supplied with antifreeze liquid.
- All jacks need to be lubricated at regular intervals.
- Establish and follow Standard Operating Procedures for maintenance and operation.
- Inspect every **six months**.
- If sent out for special work, inspect the jack before it is sent out and again upon its return.
- If subjected to abnormal load or shock, inspect the jack immediately before the work is done and again immediately after.
- If a jack is out of order, remove from service and TAG "OUT OF SERVICE" and do not use until repairs are done and it has been inspected.

21.3.3 Miscellaneous Shop Safety Practices

- ***To prevent unexpected movement of equipment undergoing repairs:***
  - √ Set brakes.
  - √ Block wheels.
  - √ Turn off equipment and keep key in pocket.
  - √ If working under a raised body, secure or block in case of accidental release of jack or hoist, etc.

- ***Moving Parts***
  - If work must be done near engine fans or exposed moving parts, keep as far away as possible and NEVER wear loose fitting clothes, ties or jewelry.

Section 21: Heavy Equipment and Fleet Services

21.3 Fleet Maintenance and Servicing - Continued

21.3.3 Miscellaneous Shop Safety Practices - Continued

- ***Radiators***
  - Protect from radiator burns by wearing heavy work gloves, safety glasses and a faceshield.
  - Stand aside and release pressure before removing radiator cap.

- ***Ventilation***
  - Shop areas need to be well-ventilated to prevent the accumulation of exhaust fumes (carbon monoxide).

- ***Steam Cleaning***
  - Care must be taken to prevent burns from hot steam and slips and falls from wet surfaces.
  - Gloves and faceshields need to be worn during steam cleaning or wash rack operations.
  - During wash rack operations, rubber shoes with slip-resistant soles are to be worn.

- ***Grease Racks***
  - During grease rack operations, it is important to clean up grease spills **immediately** to prevent slips and falls and oil absorbent materials need to be used.

- High pressure grease guns need to be used with care and tops of grease cylinders securely fastened after use.
- *Safety glasses are to be worn when using high pressure grease guns.*

- ***Gasoline***
  - Gasoline or flammable materials are NEVER to be used for cleaning.
  - Spills of gasoline are to be cleaned **immediately** and all cleaning materials disposed of in a metal, covered waste container, which needs to be emptied **daily**.
  - NO SMOKING or open flames within 100 feet of where gasoline is transferred, pumped or used.
  - During refueling, engines must be turned off and grounded fuel hoses are to be used.
  - The metal fuel nozzle needs to contact the metal tank to complete the ground and prevent static charges.
  - Use a funnel and approved safety containers when transferring gasoline.
  - Always bond and ground when transferring into a safety can.

- ***Asbestos***
  - If working with brakes containing asbestos, proper precautions must be taken and if required, respiratory protection must be worn.

Section 21: Heavy Equipment and Fleet Services

21.3 Fleet Maintenance and Servicing - Continued

21.3.3 Miscellaneous Shop Safety Practices - Continued

- ***Housekeeping***
  - See the *Housekeeping* and *Tool Safety Sections* of this Manual for specific requirements, but remember that all spills of oil, hydraulic fluids, water or other materials must be cleaned up **immediately** and tools put away after use.

- ***Lifting***
  - Hoists and other mechanical devices need to be used when possible, as well as safe lifting procedures, as shown in the *Materials Handling Section*.

21.4 Servicing Single-Piece or Multi-Piece Rim Wheels

This Section applies to multi-piece and single-piece rim wheels used on large vehicles such as trucks, trailers, buses and off-road machines. *It does not apply to rim wheels used on automobiles or truck tires designated "LT".*

21.4.1 Training

- No employee may service any rim wheel unless they are trained and instructed in correct procedures for the type of wheel being serviced and in the safe operating procedures that are listed in this Section.
- ***Training must include at a minimum:***
  The contents of *OSHA 29 CFR 1910.177*;
  The applicable data contained in the charts or rim manuals from manufacturers or other qualified organizations, which should include instructions for correct mounting, demounting, maintenance and safety precautions for the type of wheel being serviced.
- The School Board must ensure that the employees can read and understand the charts or rim manuals and must present the material in a manner that ensures comprehension.
- The School Board must evaluate the employee's proficiency and provide additional training if necessary to ensure that competency is maintained.
- ***Check employee competence in performance of the following:***
  Demounting of tires (including deflation)
  Inspection and identification of the rim wheel components
  Mounting of tires (including inflation with a restraining device or other safeguard required by this Section)
  Use of the restraining device or barrier and other required equipment
  Handling of rim wheels
  Inflation of tire when a single-piece rim wheel is mounted on a vehicle
  An understanding of the necessity of standing **outside** the trajectory both during inflation of the tire and during inspection of the rim wheel following inflation
  Installation and removal of rim wheels.

21.4 Servicing Single-Piece or Multi-Piece Rim Wheels - Continued

21.4.2 Tire Service Equipment

- The School Board must furnish a restraining device for inflating tires on multi-piece wheels.
- Restraining devices or barriers must:

- Have the capacity to withstand the maximum force that would be transferred to it during a rim wheel separation occurring at 150% of the maximum tire specification pressure for the type of rim wheel being serviced;
- Be capable of preventing the rim wheel components from being thrown outside or beyond the device or barrier for any rim wheel positioned within or behind the device;
- Be visually inspected prior to each shift's use and after any separation of the rim wheel components or sudden release of contained air.

- Restraining devices or barriers must be removed from service if they exhibit damage such as:
  Cracks at welds;
  Cracked or broken components;
  Bent or sprung components caused by mishandling, abuse, tire explosion or rim wheel separation;
  Pitting of components due to corrosion;
  Any other structural damage, which would decrease effectiveness.

- Restraining devices or barriers removed from service are not to be used until they are repaired and re-inspected.

If structural repairs have been made, such as component replacement or re-welding, it must be certified by the manufacturer or a Registered Professional Engineer.

- The School Board must furnish and assure that an air line assembly consisting of the following components is used for inflating tires:
  A clip-on chuck;
  An in-line valve with a pressure gauge or a pre-settable regulator;
  Sufficient length of hose between the clip-on chuck and the in-line valve to allow the employee to stand **outside** the trajectory.

- Current charts or rim manuals containing instructions for the type of wheels being serviced must be available in the service area.

- The School Board must furnish and assure that only tools recommended in the rim manual for the type of wheel being serviced are used to service rim wheels.

Section 21: Heavy Equipment and Fleet Services

21.4 Servicing Single-Piece or Multi-Piece Rim Wheels - Continued

21.4.2 Tire Service Equipment - Continued

- Wheel components are to be inspected prior to assembly. *Any wheel or component that is bent, pitted from corrosion, broken or cracked is to be TAGGED "OUT OF SERVICE" AND removed from the service area*.

- Damaged or leaky valves must be replaced.

- Rim flanges, rim gutters, rings, bead seating surfaces and the bead areas of tires need to be free of any dirt, surface rust, or loose or flaked rubber build-up prior to mounting and inflation.

- The size (bead diameter and tire/wheel widths) and type of both the tire and the wheel must be checked for compatibility prior to assembly of the rim wheel.

21.4.3 Safe Operating Procedures

- ***Single-Piece Rim Wheels***

  1) Remove the valve core and completely deflate the tire before demounting.
  2) Mount and demount the tire from the narrow ledge side of the wheel. *Avoid damaging the tire beads while mounting tires on wheels.*
  3) Mount tires on compatible wheels of matching bead diameter and width.
  4) Apply non-flammable rubber lubricant to the bead and wheel mating surfaces before assembly of the rim wheel, *unless the tire manufacturer does not recommend it.*
  5) If a tire changing machine is used, inflate the tire to the minimum pressure necessary to force the tire bead onto the rim ledge while on the machine.
  6) If a bead expander is used, remove it before the valve core is installed and as soon as the rim wheel becomes airtight (the tire bead slips onto the bead seat).
  7) 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.
  8) Tires must not be inflated when any flat, solid surface is in the trajectory and within one foot of the sidewall.
  9) Employees are to stay **outside** the trajectory when inflating a tire.
  10) Tires must not be inflated to more than the inflation pressure stamped on the sidewall (EVEN TO SEAT THE TIRE BEAD

AGAINST THE RIM FLANGE) unless a higher pressure is recommended by the manufacturer.
11) No heat may be applied to a single-piece wheel.
12) Do not rework, weld, braze or heat, cracked, broken, bent or damaged wheels.

Section 21: Heavy Equipment and Fleet Services

21.4 Servicing Single-Piece or Multi-Piece Rim Wheels - Continued

21.4.3 Safe Operating Procedures - Continued

- ***Multi-Piece Rim Wheels***

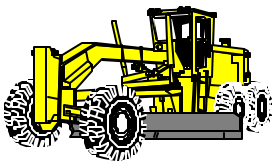
1) Remove the valve core and completely deflate tires before demounting if the tire has been driven under inflated at 80% or less of recommended pressure or when there is obvious or suspected damage to the tire or wheel components.
2) Apply rubber lubricant to the bead and rim mating surfaces during assembly of the wheel and inflation of the tire unless the manufacturer does not recommend it.
3) An under inflated tire that has more than 80% of the recommended pressure, may be inflated while the rim wheel is on the vehicle, if remote control inflation equipment is used and no employees are in the trajectory during inflation.
4) Tires may 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.
5) If a rim wheel is in a restraining device the employee must not rest or lean any part of his/her body or equipment on or against the restraining device.
6) After tire inflation, the tire and wheel components need to be inspected while still within the restraining device to ensure that they are properly seated and locked. If not, and further adjustment to the tire or wheel components is necessary, the tire must be deflated by removing the valve core before adjustments are made.
7) No attempt should be made to correct the seating of side and lock rings by hammering, striking or forcing the components while the tire is pressurized.
8) Do not rework, weld, braze or heat cracked, broken, bent or damaged rim components.
9) Do not apply heat to a multi-piece wheel or wheel component.

10) Employees are to stay **outside** the trajectory unless the employer can demonstrate that performance of the servicing makes the employee's presence in the trajectory necessary.

21.5 General Heavy Equipment

21.5.1 Equipment Not in Use

- If left unattended at night, near a highway in use or near a construction area where work is in progress, equipment needs to have lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of the equipment.



- Machinery or equipment suspended by slings, hoists or jacks must be blocked to prevent falling or shifting before employees can work under or between them.

Section 21: Heavy Equipment and Fleet Services

21.5 General Heavy Equipment - Continued

21.5.1 Equipment Not in Use – Continued

- Bulldozer and scraper blades, end-loader buckets, and similar equipment must be fully lowered or blocked when not in use. Controls are to be in a neutral position, motors stopped and brakes set.

- To park equipment, set the parking brake; if on an incline, chock the wheels.

21.5.2 Off-Highway Motor Vehicles

- ***Vehicles need to have:***
  Service brake system;
  Emergency brake system;
  Parking brake system in good operating condition;
  If necessary for visibility, vehicles must have two operating headlights and taillights;
  Brake lights must be operational at all times;

A horn or audible warning device must work and be near the operator.

- If the view to the rear is obstructed, the motor vehicle must:
  Have a reverse signal alarm audible above surrounding noise level; or
  Back up ONLY when an observer signals that it is safe to do so.

- All vehicles with cabs need to have windshields and powered wipers. Cracked and broken glass is to be replaced **immediately**. If fogging or frosting can occur, a defrost/defog device needs to be installed.

- All haulage vehicles, whose payload is loaded by cranes, loaders, etc. must have a cab shield or canopy to protect the operator from shifting or falling materials.

- Tools or equipment need to be in a tool compartment or secured to prevent movement if in the cab with employees during transport.

- Seats must be firmly secured and adequate for the number of drivers/passengers. **No** extra riders are allowed.

- Seat belts must be installed and used in all motor vehicles.

Section 21: Heavy Equipment and Fleet Services

21.5 General Heavy Equipment - Continued

21.5.2 Off-Highway Motor Vehicles - Continued

- Trucks with dump bodies must be equipped with a means of support permanently attached and capable of being locked into position to prevent accidental lowering of the body while maintenance or inspection work is being done.

- Operating levers controlling hoisting or dumping devices on haulage bodies are to be equipped with a latch or other device, which will prevent accidental starting or tripping of the mechanism.

- Trip handles for the tailgate of dump trucks must be arranged so that when dumping the operator will be in the clear.

- All rubber-tired motor vehicle equipment must have fenders. *Mud flaps may be used in lieu of fenders when the vehicle is not designed for fenders.*

- ***Check/Inspect Equipment at Beginning of Each Shift For*:**

  Service brakes
  Trailer brake connections
  Hand brake
  Brakes
  Tires
  Horn
  Steering
  Coupling devices
  Seat belts
  Operating controls
  If required for operation: lights, reflectors, windshield wipers, defrosters, fire extinguishers, etc.
  All safety devices.

Defects must be corrected before the vehicle is placed in service.

21.5.3 Earth-Moving Equipment

- ***Includes:*** Scrapers, loaders, crawler tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors and all similar equipment.

Section 21: Heavy Equipment and Fleet Services

21.5 General Heavy Equipment – Continued

21.5.3 Earth-Moving Equipment - Continued

- Seat belts must be provided and used on all equipment, unless the equipment is designed ONLY for standup operation or does not have a rollover protective structure (ROPS) or adequate canopy protection.

- Construction equipment/vehicles may only be moved on access roadways or grades that can safely accommodate such movement.

- Braking systems are to be installed and must be capable of holding the equipment fully loaded.

- Pneumatic-tired earth-moving haulage equipment, such as trucks, scrapers, tractors and trailing units whose maximum speeds exceed 15 mph must have fenders on all wheels.

- Horns that are distinguishable from surrounding noise levels are to be installed on bi-directional machines, i.e., rollers, compactors, front-end loaders, bulldozers and similar equipment. Horns must be operational.
- Earth-moving or compacting equipment with an obstructed view to the rear cannot be used in reverse unless it has a reverse signal alarm distinguishable from the surrounding noise level or another employee signals that it is safe to do so.
- Scissor points on front-end loaders which are hazardous to the operator during normal operations must be guarded.

21.5.4 Lifting and Hauling Equipment

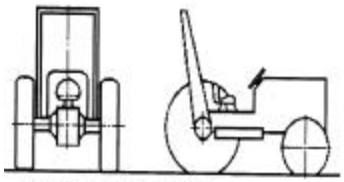
- Lift trucks and stackers are to have the rated capacity clearly posted on the vehicle and clearly visible to the operator.
- No modifications to the equipment, which affect capacity or safe operation, can be made without the manufacturer's **written** approval. The safety factor of the equipment CANNOT BE REDUCED under any circumstances.

Section 21: Heavy Equipment and Fleet Services

21.6 Rollover Protective Structures (ROPS)

21.6.1 General

- Applies to the following used in construction work (with or without attachments):
  - √ Rubber-tired, self-propelled scrapers
  - √ Rubber-tired front-end loaders
  - √ Rubber-tired dozers
  - √ Wheel-type agricultural and industrial tractors
  - √ Crawler tractors



Typical Frame Configuration
Agricultural or Industrial Tractor

- The ROP and supporting attachment is to be designed, fabricated and installed in a manner, which will support two times the weight of the prime mover applied at the point of impact.

- *Design objective* - to minimize likelihood of complete overturn.

- Must provide vertical clearance of 52 inches from the work deck to the ROPS where equipment is entered.

- If the ROP is removed, it must be remounted with equal or better quality bolts or welding.

- Each ROP must have the following information **permanently** affixed:
  - Manufacturer/fabricator's name and address
  - Model number, if any
  - Machine make, model and series it is designed to fit

21.7 Site Clearing

21.7.1 Hazards

- If possible, employees should be informed of the potential presence of irritating or toxic plants and provided first aid treatments should exposure occur.

Section 21: Heavy Equipment and Fleet Services

21.7 Site Clearing - Continued

21.7.1 Hazards - Continued

- Employees should be careful when handling debris or discarded materials and understand that spiders, snakes and other harmful animals may be within such materials. To avoid such encounters:
  - √ Keep hands and feet out of areas you can't see.
  - √ Always wear gloves when handling outside debris.

21.7.2 Site Clearing Equipment

- Equipment used in site clearing operations must be equipped with rollover guards.
- Rider-mounted equipment must be equipped with an overhead and rear canopy guard that is not less than 1/8 inch steel plate or ¼ inch woven wire mesh with openings no greater than one inch or equivalent.
- The opening in the rear of the canopy structure must be covered with not less than ¼ inch woven wire mesh with openings no greater than one inch.

21.7.3 Training

- Employees engaged in site clearing need to be informed of the first aid treatment for irritants and toxic plants before work begins.

21.8 Recordkeeping

21.8.1 Records Retention

Record	Maintained By	Retention
General Maintenance/Inspection Records	Facility Directors/Supervisors	1 Year
Training	Facility Directors/Supervisors	Most Current

Section 22: Housekeeping

22.1 Introduction

Good housekeeping is an essential part of any safety program. A clean facility and/or workplace will help prevent fires, reduce accidents and personal injuries and improve the appearance of all work areas. The following are "good housekeeping" guidelines for all School Board of Brevard County facilities.

State Requirements for Educational Facilities (SREF)

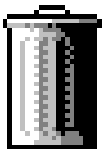
22.2 Housekeeping Requirements

22.2.1 General

- Each area needs to be kept as clean, orderly and sanitary as possible, to the extent that the nature of the work will allow.
- Work areas need to be kept dry, if possible. Areas where wet processes are used must have drainage, as well as a floor, platform, mat or other dry standing place.
- Slipping hazards, such as water or grease, are to be cleaned up **immediately**.

- Areas need to be kept free of protruding nails, splinters, holes, loose boards and debris.
- Walkways and roadways are to be kept clear of obstructions, slipping and tripping hazards, broken glass and other debris.
- Work areas must be constructed, as far as practical, to prevent the entrance of rodents, insects or other pests.
- Vegetation control needs to be implemented.

22.2.2 Waste Disposal



- Receptacles need to be constructed so that they do not leak and are to be cleaned and maintained in a sanitary condition.
- Receptacles need to have a tight fitting cover, unless they can be maintained in a sanitary condition without one.
- All sweepings, solid or liquid waste, refuse and garbage must be removed as often as necessary to maintain a sanitary condition.

Section 22: Housekeeping

22.2 Housekeeping Requirements - Continued

22.2.2 Waste Disposal - Continued

- Metal containers are to be provided to catch industrial scraps and waste as they accumulate.

- Combustible waste, rags, paper or other flammable materials are to be disposed of into marked metal containers with self-closing lids and emptied **daily**.

See the *Fire Safety and Prevention Section*.

- In areas where employees are allowed to consume food and beverages on the premises, a waste disposal container with a tight-fitting lid should be provided for the disposal of waste food. The receptacle should be emptied once per day and maintained in a clean and sanitary condition.

22.2.3 Materials Storage

- Materials are not to be stored in front of doors, exits, fire extinguishers, safety showers or any other emergency or safety equipment.

- Storage areas must be kept free from the accumulation of materials that may cause tripping, fire or explosion hazards.

- Loading dock areas are to be kept free of waste materials, scrap materials and other debris.

See the *Materials Handling Section*.

22.2.4 Electrical Hazards

- Housekeeping duties must not be performed close to live parts that present an electrical contact hazard if there is the possibility of contact. Barriers or safeguards such as insulating equipment may be used to prevent contact.

- Electrical conductive cleaning materials such as steel wool, metalized cloth, silicon carbide and liquid solutions must not be used near energized parts unless procedures are followed that will prevent electrical contact.

Section 22: Housekeeping

22.3 Housekeeping in Schools

22.3.1 General Requirements

- Student-occupied areas, classrooms, inside assembly areas and corridors and other areas designed for occupancy by more than two (2) persons, must be cleaned daily.

- Administrative and faculty offices designed for single or double occupancy must be cleaned at least once per week.
- Toilet rooms, food service areas, shower and locker rooms and clinics must be cleaned and sanitized daily using an appropriate germicidal or bacteriostatic cleaner.
- Floor drains must be sanitized and flushed with water at least once a day.
- Filters used with HVAC equipment must be kept clean and serviceable at all times.
- Light fixtures and windows must be kept clean and in good repair.
- Trash and waste containers must be provided in all areas, sufficient in number to handle the daily accumulation of trash. They must be emptied daily and stored in bins or containers at a central waste disposal area until removal from the facility.
- Custodial areas must:
  - √ Be kept clean, safe and orderly.
  - √ Equipment must be maintained and in good repair.
  - √ Supplies and equipment must be stored appropriately and never in electrical or mechanical rooms, unless they are designed for that purpose.

NOTE: **A cleaning schedule for each school, using prescribed cleaning methods must be established.**

22.4 Recordkeeping

22.4.1 General

Inspection records will be maintained on file.

22.4.2 Records Retention

Record	Maintained By	Retention
Inspections*	**õ Custodians** **õ Fire Safety and Sanitation Inspectors**	**Daily** **12 Months**

**See Monthly Inspection Form*

Section 23: Laboratory Safety (Wastewater)

23.1 Introduction

This Section applies to those facilities within the Brevard County where hazardous chemicals are used in accordance with the definitions of laboratory use and laboratory scale. A *Chemical Hygiene Plan* that complies with the requirements of OSHA's *Occupational Exposure to Hazardous Chemicals in Laboratories Standard* is to be provided along with site specific procedures for laboratory activities. See the *Science Education Safety Section* for specific school laboratory safety information.

OSHA 29 CFR 1910.1450

23.2 Chemical Hygiene Plan

23.2.1 General Principles

- All chemicals or substances of unknown toxicity are to be considered **hazardous** until proven otherwise.
- Any mixture of chemicals is to be considered more toxic than the most hazardous component.

23.2.2 Purpose

- It is the purpose of this plan to provide a general guide for handling hazardous chemicals in School Board of Brevard County laboratories. This plan is designed to establish the basic safety principles for laboratory procedures, equipment and work practices in order to protect employees from the hazards of laboratory work. This plan is to be used in conjunction with the *Hazard Communication Program,* which is contained in the *Chemical Safety Section* of this Plan.

Responsibilities

- **Principals, Facility Managers or their Designees**

  Provide support for the *Chemical Hygiene Program* and the Chemical Hygiene Officer.
  Ensure that a Chemical Hygiene Officer (CHO) is appointed at each site and identified in the Site Specific Section of this Manual.

23.2.3 Responsibilities – Continued

- **Chemical Hygiene Officer (CHO)**

  Work with management and employees to develop and implement chemical hygiene policies and procedures;
  Monitor the purchase, use and disposal of chemicals used in the lab;
  Ensure that laboratory inspections are conducted;
  Assist in development of safe work precautions and safe facilities;
  Be familiar with applicable state, local and federal laws and standards;
  Review this *Chemical Hygiene Plan* at least **annually** and make revisions, as necessary.

- **Supervisor**

  - Ensure that workers are aware of and follow the *Chemical Hygiene Plan;*
  - Ensure that the appropriate personal protective equipment (PPE) is available and in good condition;
  - Ensure that the appropriate training has been provided to employees;
  - Provide regular inspections of emergency equipment and for good housekeeping practices;
  - Develop an annual inventory of chemicals present in the laboratory, including MSDSs.

- **Laboratory Employees**

  - Follow all health and safety rules and procedures and all local, state and federal standards;
  - Report all suspected hazardous conditions to the Supervisor, Chemical Hygiene Officer or Environmental Health and Safety Office.
  - Report all job-related injuries, exposures and suspected illnesses;
  - Operate only equipment and instrumentation for which they have received training;
  - Need to be aware of the hazards of the chemicals with which they work with and the safe handling procedures and **read and familiarize themselves with the MSDSs**;
  - When unsure of how to handle a hazardous chemical or perform a procedure, request information and training.

23.2 Chemical Hygiene Plan - Continued

23.2.4 General Safety Guidelines

Access to the laboratory is to be restricted and posted **"Authorized Personnel Only"**.
A **" No Smoking"** policy is to be enforced.

Eating, drinking and/or the application of cosmetics or lip balms is forbidden in areas where hazardous chemicals are being used. Food is not to be stored in the same refrigerator with chemicals or lab samples.
No horseplay, inappropriate or unprofessional behavior is permitted in the laboratory.
Loose clothing is not to be worn and long hair is to be tied back.
Passageways, stairways and hallways must be kept clear and unobstructed. Access to exits, emergency equipment and utility controls are never to be blocked.

23.2.5 The Laboratory Facility

- **Ventilation**

  General ventilation must be available and be able to continuously replace air to prevent an increase in concentrations of toxic substances throughout the work day. The air must flow into the lab from non-laboratory areas and be directed out to the exterior of the building. Stockrooms and storerooms where chemicals are stored are required to be ventilated.

- **Safety Equipment**

  - The following safety equipment is to be provided and must be easily accessible:

    Eyewash fountain
    Safety shower or drench hose
    Fire extinguisher
    Fire alarm
    Telephone or other communication device
    Emergency lighting
    Spill response kits (biohazard and chemical)

Section 23: Laboratory Safety (Wastewater)

23.2 Chemical Hygiene Plan - Continued

23.2.5 The Laboratory Facility - Continued

- **Fume Hoods**
  - **Fume hoods are to be available wherever toxic vapors or dust could be released and where work is done with volatile substances with a Threshold Limit Value (TLV) <50 parts per million (ppm).**

    Hood performance must be confirmed before each use, are to be inspected **monthly** and the air flow certified **annually**.

23.2.6 Chemical Purchasing, Distribution and Storage

- **Procurement**
  - All laboratory chemicals are to be procured only through recognized sources and no chemical is to be accepted unless properly packaged and labeled and contains an MSDS.
  - Before a substance is received in the laboratory, information regarding proper handling, storage and disposal is to be relayed to those employees involved in its handling and/or use.
  - New chemicals can only be purchased after the approval of the Supervisor, Chemical Hygiene Officer or Environmental Health and Safety Office.

- **Stockrooms, Storerooms and Cabinets**

  - Hazardous substances must be segregated into compatible categories in a well-identified (signs, labels, etc.) area with local exhaust ventilation and adequate illumination.

    Attach the applicable label/sign to identify areas where corrosives, carcinogens, flammables, etc. are stored. (**"Corrosive Materials," "Cancer Hazard," "Flammables," etc.)**

    HIGHLY toxic chemicals (those with a lethal dose of 50 milligrams or less, i.e. LD_{50}) must be in unbreakable secondary containers.
    Corrosive materials in containers >two gallons need to be stored no higher than two feet above floor level.
    All stored chemicals are to be examined at least **annually** for replacement, deterioration and container integrity.

Section 23: Laboratory Safety (Wastewater)

23.2 Chemical Hygiene Plan – Continued

23.2.6 Chemical Purchasing, Distribution and Storage - Continued

- **Stockrooms, Storerooms and Cabinets – Continued**

Compressed gases with regulators need to be secured individually.
Cylinders with valve protection caps in place may be chained in compatible groups.
All cylinders are to be stored in an upright position.
Separate oxygen cylinders from flammable cylinders by 20 feet or with a fire wall.
When handling compressed gases, workgloves and eye protection are required.
Use compatible gauges, fittings, lubricants, etc. (i.e. oil-free or oxygen compatible)

If chemicals are stored in the laboratory area, store as small a supply as practical. *Avoid storage in hoods or on bench tops.*

- **Distribution**

Hand carried chemicals need to be placed in an outside container or bucket.
Carry glass containers in designed carriers or a leak resistant, unbreakable secondary container.
When using a cart to transport chemicals, use one suitable for the load with high edges to contain leaks or spills.

23.2.7 Working with Chemicals

- **General Safe Work Precautions**

Know what to do in the event of a spill. Know where the spill response kit is and what procedures are to be followed for each chemical.
Review the MSDSs.
Avoid routine exposure - NEVER SMELL OR TASTE chemicals.

Eating, drinking, gum chewing or application of cosmetics in areas where lab chemicals are present is prohibited. ALWAYS WASH HANDS BEFORE CONDUCTING THESE ACTIVITIES.

Section 23: Laboratory Safety (Wastewater)

23.2 Chemical Hygiene Plan – Continued

23.2.7 Working with Chemicals – Continued

- **General Safe Work Precautions - Continued**

  Handle and store lab glassware with care to avoid damage. Only use glassware for its intended purpose and NEVER use damaged glassware.

  NEVER use mouth suction for pipetting or starting a siphon.

  Always keep the work area as clean and uncluttered as possible.

  Clean up at the end of each operation, when possible, and at the end of each day.

  Wash exposed skin thoroughly before leaving the laboratory.

  All safety and other equipment are to be checked before each use and at least **monthly**. The following is a list of equipment that should be checked and is meant to be illustrative only, not all inclusive:

  PPE including gloves, aprons, eye protection and faceshields;

  All glassware;

  Respirators, to ensure that both the mask and cartridges are proper and serviceable;

  Electrical equipment to ensure that all cords and connectors are free of defects;

  Eyewash and shower;

  Fume hood - check operation before each test requiring the use of the hood. Check by closing the cover to the lowest position and ensuring negative pressure (air is being drawn in). NEVER hold a match in front of the hood to check it since flammable material may be inside;

  Safety valve on the autoclave (open manually);

  Fire extinguisher - check gauges **monthly** and have serviced **annually** (see *Fire Safety and Prevention Section*);

  First Aid Kit (See *First Aid Section*).

Section 23: Laboratory Safety (Wastewater)

23.2 Chemical Hygiene Plan – Continued

23.2.7 Working with Chemicals – Continued

- **Working with Carcinogens, Reproductive Toxins and Highly Toxic Chemicals**

A Standard Operating Procedure (SOP) must be developed and include the following:

- A list of the hazards associated with each chemical;
- Likely exposure routes;
- Designated areas authorized for use;
- Engineering controls required, such as a restricted access hood, glove box, etc.;
- Personal protective equipment (PPE) required;
- Require that warnings be given to all employees with access to the restricted areas when activities are being conducted;
- Housekeeping and decontamination procedures;
- Waste disposal procedures;
- Spill and accident procedures;
- Include a review of the MSDSs.

Always use a hood with a velocity that meets manufacturer specifications to trap vapors or aerosols.
Place chemicals that are in breakable containers on chemical-resistant trays.
Remove protective apparel before leaving designated area and place in appropriate labeled disposal container.
Decontaminate all pumps and other equipment before removing them from the designated area.

Use a wet mop or HEPA filter vacuum to decontaminate surfaces. DO NOT DRY SWEEP.
Use vacuum pumps with scrubbers or HEPA filters and vent into hood.
Avoid all skin contact. Use gloves, long sleeves and protective apparel.
Wash hands and arms IMMEDIATELY after working with these chemicals.
Maintain records of the amounts of these chemicals on hand, the amounts used, and the names of all employees who use them.
Be prepared for accidents and spills. Ensure that two people are present if a compound is highly toxic or of unknown toxicity.

NOTE: **Many chemicals can be embryotoxic. It is recommended that any employee who is pregnant immediately report such information to the Supervisor. The employee will have the option of being reassigned to alternate duties, not involving chemicals, until a complete review of all occupational exposures is completed.**

Section 23: Laboratory Safety (Wastewater)

23.2 Chemical Hygiene Plan – Continued

23.2.7 Working with Chemicals – Continued

- **Working with Flammable/Combustible Materials**

NOTE: **Flammable materials are those with a flash point <100°F. Combustible materials are those with a flash point ≥100°F and ≤200°F.**

Eliminate ignition sources, open flames, hot surfaces, etc., when possible.
Store in NFPA approved liquid containers, in storage cabinets or in an area designed for the safe storage of flammable materials.
Use proper bonding and grounding when transferring from a drum or other large container.
Assure that there is a fire extinguisher in the lab and that it is easily accessible.
A Standard Operating Procedure (SOP) must be developed for working with Class 1A and 1B chemicals. **(<73°F flash point)**

- **Working with Corrosive Materials**

  - Containers used for storage and processing must be corrosive-resistant.

- Eye protection and rubber gloves are to always be worn.
- A faceshield must be worn if working with more than four liters or where splashing might occur and a rubber apron and rubber boots may also be necessary.
- NEVER ADD WATER TO ACID. Add acids SLOWLY to water.
- Ensure that an eyewash and safety shower are readily accessible.
- Know emergency procedures. Refer to the MSDSs.
- An SOP must be developed for working with HIGHLY corrosive materials.

- **Working with Organic Peroxides**

  - Always use extreme care when handling.
  - Date all peroxides when they are received and again when they are opened.
  - Dispose of after recommended time (see label, MSDS and manufacturer's recommendations).
  - Do not open any container, which has a solid formation around the lid.
  - Add an inhibitor to quench the formation of peroxides, if possible.
  - An SOP must be developed for handling these hazardous chemicals.

Section 23: Laboratory Safety (Wastewater)

23.2 Chemical Hygiene Plan – Continued

23.2.7 Working with Chemicals – Continued

- **Working with Oxidizers**

Know the reactivity of such materials. Refer to the MSDSs.
Use shields if there is the potential for a violent or explosive reaction.
Keep ignition sources away (oxidizers do not burn, but do support combustion).

23.2.8 *Injury and Illness*

Department emergency response procedures are to be followed in the event of an injury, illness or exposure (see *Emergency Procedures Section* of this Plan).
First aid kits need to be provided and inspected on a **monthly** basis to ensure that they contain essential supplies at all times (see *First Aid Section* of this Plan).
All occupational illnesses and/or injuries must be reported.

23.2.9 Medical Examinations

Medical surveillance protocols need to be established for those employees who are routinely exposed to chemicals that exceed the PEL, as determined by environmental monitoring.

In addition, any employee who develops signs and symptoms associated with a hazardous chemical to which they have been exposed, will receive an appropriate medical examination at no cost to them.

If there is a spill, leak or other occurrence that results in hazardous exposures, affected employees are to be provided the opportunity to obtain a medical consultation to determine if there is a need for a physical examination.

The following information is to be provided to the authorized physician:

The identity of the hazardous chemical to which the employee may have been exposed and a copy of the MSDS for the chemical;

A description of the conditions surrounding the exposure; and

A description of the signs and symptoms the employee is experiencing which may indicate he/she had a possible exposure.

Section 23: Laboratory Safety (Wastewater)

23.2 Chemical Hygiene Plan – Continued

23.2.10 Environmental Monitoring

Personal monitoring (detectors, badges, monitors, etc.) to determine exposure levels is required if a highly toxic substance (a chemical with a median lethal dose of LD_{50} or less) is used more than three times per week.

Initial monitoring must be performed if the PELs could reasonably be expected to be exceeded during exposures.

If initial monitoring reveals that exposure above PELs has occurred, periodic monitoring must be performed to ensure that abatement activities and engineering controls implemented are effective in reducing exposure to an acceptable level.

23.2.11 Personal Protective Equipment and Clothing

- **Requirements**

Safety Glasses 	√ **Wear when entering the lab or working with chemicals that do not require chemical splash goggles. Wear when working with compressed gases.**
Splash Goggles 	√ **Wear when working with corrosives, carcinogens, strong oxidizers or where a splash hazard exists.**
Faceshields 	√ **Wear when working with more than four liters of corrosive liquids. Wear with splash goggles.** √ **Use ultraviolet light faceshields when working over UV light sources.**
Gloves 	√ **Wear the appropriate* chemical glove.** √ **Use insulated gloves for temperature extremes.** ***Use the PPE Assessment, the MSDS or the manufacturer's recommendations to determine the type glove and material required.**
Respiratory Protection 	√ **If engineering controls cannot reduce concentrations to acceptable levels and if PELs or TLVs may be exceeded, the appropriate* respiratory protection must be worn.** ***Use the PPE Assessment and *Respiratory Protection Section* of this Plan to aid in selection.**
Protective Clothing 	√ **A lab coat is to be worn when working with any chemicals.** √ **An impervious lab coat, coveralls, an apron or protective suit must be worn when working with more than five gallons of corrosive liquid.**

Section 23: Laboratory Safety (Wastewater)

23.2 Chemical Hygiene Plan – Continued

23.2.11 Personal Protective Equipment and Clothing - Continued

NOTE: **Eye protection is to be worn by everyone entering the lab.**

- **PPE – General**

Gloves are to be inspected before each use, washed before removal and replaced as necessary due to damage or deterioration.
Avoid the use of contact lenses in the lab unless absolutely necessary.

23.2.12 Spills and Discharges

Minor Spill - One that causes no injury to an employee, the facility or the environment, will not reach navigable waters and can be cleaned up safely.

*In the event of a **MINOR** spill:*

1) Barricade the area to prevent entry.
2) Obtain the Material Safety Data Sheet (MSDS), determine the hazards, personal protective equipment (PPE) and containment requirements.
3) Ventilate the area.
4) Remove sources of ignition and ensure that a fire extinguisher is readily available.
5) Wear appropriate PPE:
   - Rubber gloves;
   - Eye/face protection (glasses, goggles, faceshield) determined by the level of exposure;
   - Appropriate air-purifying respirator if exposures are unknown or exceed the permissible exposure limit (PEL) as established by OSHA.
6) Avoid breathing vapors.
7) Confine the spill with inert absorbents. Stop the source of spilled material, if possible.
8) Clean up with spark-proof tools.
9) Material and absorbents are to be placed in a container, labeled following DOT standards and disposed of according to all local, state and federal regulations.
10) PPE and tools are to be decontaminated and discarded or stored appropriately.
11) Review incident and determine measures to prevent reoccurrence.

Section 23: Laboratory Safety (Wastewater)

23.2 Chemical Hygiene Plan – Continued

23.2.12 Spills and Discharges – Continued

Major Spill - Any hazardous chemical spill that may cause injury, enter navigable waters, cause harm to the environment or escape a facility's premises.

*In the event of a **MAJOR** spill:*

The employee who discovers the spill needs to:

1) Stay out of the danger zone.
2) Request assistance from the Emergency Response Team (if on site) and call "**911**" and request outside Emergency Response agencies.
3) Keep all employees out of the area and barricade or confine spill area from a ***safe distance.***

The Chemical Hygiene Officer and/or the Supervisor need to determine if the evacuation procedures are to be implemented and if so, will follow the guidelines in the *Emergency Procedures Section* of this Plan.

- **Mercury Spills**

  For small spills (<1 cc), use a trapped vacuum line attached to a tapered glass tube to pick up mercury droplets.
  Cover with: *sodium polysulfide solution* or *powdered sulfur*.
  Place in an approved container for hazardous waste collection.

- **Spill Kits**

  - A **chemical spill response kit** needs to be available and contain at a minimum the following:
    Splash goggles;
    Chemical-resistant gloves;
    Plastic bags for disposal;
    Chemical sorbent (enough for two gallons);
    Scooper (or dustpan with brush).

    A **biohazardous waste spill response kit** needs to be available and contain at a minimum the following:
    Splash goggles or safety glasses;
    Latex gloves and latex utility gloves;
    Plastic bags for disposal (red bag);
    Virulcidal disinfectant (a bleach solution may be used instead);
    Biohazard label;
    Scooper (or dustpan with brush).

23.2 Chemical Hygiene Plan – Continued

23.2.13 Waste Disposal

Deposit chemical waste and biomedical waste in appropriately labeled covered receptacles.

NEVER discharge the following into a sewer:

- √ Concentrated acids or bases;
- √ Highly toxic substances;
- √ Any substance that may interfere with the biological activity of wastewater treatment plants;
- √ Any substance that could create a fire or explosion hazard.

Upon initial waste collection, tag and label containers, "Hazardous Waste" or "Biohazardous Waste" and mark with the start date of accumulation.

IV. Store in restricted area and accumulate hazardous chemical waste on site for 90 days or less, biohazardous waste for 30 days or less.

V. Separate wastes. Never mix hazardous chemical and biomedical wastes or incompatible chemical wastes.

VI. Unlabeled containers of chemicals and solutions need to be disposed of promptly. If partially used, do not open.

VII. Follow recommended procedures in the *Bloodborne Pathogens* and *Hazardous Waste Sections* for proper disposal procedures.

VIII. Sharps must be accumulated in an approved disposal container and removed, sealed and disposed of when filled to less than 2/3 of its total capacity, following procedures outlined in the *Bloodborne Pathogens Section*.

If biohazardous waste is treated and destroyed using an autoclave or other methods in the laboratory, an SOP must be written using the manufacturer's recommendations. A copy should be inserted in the Site Specific Section.

23.2.14 Training and Information

I. Employees are required to have access to information and appropriate training to ensure that they are aware of the hazards of the chemicals that are present in the workplace. The *OSHA Hazard Communication* training requirements will satisfy the bulk of the information necessary for safe work with chemicals, however, for laboratory employees, the following information must also be provided before work is assigned and as required**:**

II. Protective measures for working with laboratory chemicals;

III. Laboratory Standard Operating Procedures (SOPs);

IV. Specific laboratory emergency response procedures;
V. Personal protective equipment requirements;
VI. Contents of the *Chemical Hygiene Plan*.

Section 23: Laboratory Safety (Wastewater)

23.2 Chemical Hygiene Plan – Continued

23.2.15 Laboratory Safety Checklist

A copy of the following checklist can be found in the *Forms Section* of this Plan.

Laboratory Safety Checklist	
I. Emergency phone numbers posted?	I. Gas cylinders secured?
II. Warning signs posted on doors?	II. Cylinders in good condition, not leaking?
III. MSDSs available-employees aware of locations?	III. All chemical containers properly labeled?
IV. Employees have received, HazCom and Lab Specific Training?	IV. Chemicals stored according to compatibility?
V. PPE available?	V. Corrosives separated, storage areas marked?
VI. Eyewash within 25 ft. of corrosive work/use area?	VI. Flammables/combustibles stored separately, cabinets, areas marked?
VII. Emergency shower/drench hose present?	VII. Peroxide forming reagents dated when opened?
VIII. Food/Beverages not stored/consumed in Lab?	VIII. Peroxide forming reagents disposed of after expiration date?
IX. Aisles uncluttered, no tripping hazards?	IX. Corrosives stored close to floor level?
X. Safety equipment unobstructed, signs indicate locations?	X. Carcinogen storage areas labeled?
XI. Spill kits available?	XI. Chemicals in lab kept to a minimum?
XII. Sharps containers used?	XII. Less than 10 gls of flammables in lab?
XIII. Fume hoods functional, inspected?	XIII. Flammable gases not present?
XIV. Exitways unobstructed, illuminated?	XIV. Toxic gases not present?
XV. Fire extinguishers accessible, unobstructed?	XV. Hazardous waste containers closed, labeled?
XVI. Fire extinguishers inspected, seals intact?	XVI. Hazardous waste tags completed?

XVII. Chemical Inventory maintained?	XVII. Hazardous waste not stored beyond 90 days, biohazard wastes less than 30 days.
COMMENTS:	

Section 23: Laboratory Safety (Wastewater)

23.3 Recordkeeping

23.3.1 Records Retention

Record	Maintained By	Retention
Inspection Records	**Principals or Facility Managers/Wastewater Treatment Plant Technician**	**5 Years**
Training	**Environmental Health and Safety**	**Most Current**
Biohazardous Waste Transporter Documentation or Sterilization and Treatment Logs	**Principals or Facility Managers or Designee/Wastewater Treatment Plant Technician**	**5 Years**
Hazardous Waste Manifests	**Contractor/Wastewater Treatment Plan Technician**	**5 Years**
Medical Records	**Occupational Health Care Provider**	**30 Years (After the employee is no longer employed by the School Board)**
Exposure Records	**Environmental Health and Safety Office**	**30 Years (For MSDSs, 30 Years after the chemical is no longer in use)**

Section 24: Lockout/Tagout

24.1 Introduction

The School Board of Brevard County has established the following general Lockout/Tagout Program in order to ensure that employees and other personnel are protected from hazards related to the unexpected energization, startup or release of stored energy during machinery and/or equipment servicing or maintenance work.

29 CFR 1910.147

24.2 General Requirements

Lockout/Tagout is the process of putting equipment into a temporary condition in which ALL power is blocked.

24.2.1 It is required:

- During setups, when a machine is being prepared for operation;
- Whenever guards, safety switches, or other safety devices are removed or bypassed in order to perform:
  - √ Maintenance;
  - √ Trouble-shooting; (if feasible)
  - √ Repairs or servicing.
- When any part of the employee's body may be placed into a possible danger zone.

24.2.2 It is NOT required:

- When making minor tool changes, adjustments and/or other servicing activities during **normal** production operations that are routine, repetitive and integral to the use of the equipment and alternative methods are used that provide effective protection.

- When work is done on cord and plug connected electric equipment under the control of the employee performing the servicing or maintenance.

Remember, BEFORE you remove or bypass a guard or other safety device, or get any part of your body into a possible danger zone, LOCK or TAG out the energy source. THIS IS NOT CONSIDERED A NORMAL, ROUTINE PART OF PRODUCTION.

Section 24: Lockout/Tagout

24.3 Potential Energy Sources

All energy sources must be identified, isolated and controlled by locking and tagging out disconnects, valves, etc. before work is conducted.

24.3.1 Energy may be either:

1) Kinetic (energy in motion), or
2) Potential (stored energy)

24.3.2 Different types of energy that may be found in the workplace and may include:

- Chemical energy which may include, corrosives, flammables, reactives, toxins or asphyxiants;
- Electrical energy;
- Gravitational energy, when weight or position can cause movement;
- Hydraulic energy generated by liquids under pressure;
- Mechanical energy which includes: spring driven equipment, clutches, cams, etc.;
- Pneumatic energy generated by pressurized gas or air; and
- Thermal energy - extreme heat or cold.

24.4 Initial Lockout/Tagout Survey

24.4.1 General

- An initial survey of all machines and equipment must be conducted to identify and categorize energy sources and control methods.

- The survey must identify and include:
  - √ The name of the person conducting the survey;
  - √ The date of the survey;
  - √ The identification name or number of the equipment/machinery;
  - √ The location of the equipment/machinery;
  - √ A list of all energy sources;
  - √ Any available isolation devices such as circuit breakers, valves, disconnects, etc.;
  - √ A list of required lockout/tagout devices;
  - √ The names of any "affected personnel"; and
  - √ Any special shutdown or startup procedures.

A copy of these completed surveys is to be retained at each facility.

Section 24: Lockout/Tagout

24.4 Initial Lockout/Tagout Survey - Continued

24.4.2 Lockout/Tagout Initial Survey Form

- The following form is found in the *Forms Section* of this Plan and may be duplicated and used to document the initial survey:

Lockout/Tagout Initial Survey

Machine/equipment _____ **Date** _____
Location _____ **Completed by:**_____

Energy Source	**Isolation Device**	**Lockout/Tagout Devices**
_____ _____	_____	
_____ _____	_____	
_____ _____	_____	
_____ _____	_____	
_____ _____	_____	

Affected personnel	**Shut down procedure**	**Startup procedure**
_____ _____	_____	
_____ _____	_____	
_____ _____	_____	
_____ _____	_____	

Drawings, Sketches, etc.

24.5 Lockout/Tagout Devices

24.5.1 General

- A lockout device is to be used unless a lock cannot be attached to the isolation device, or it is not otherwise feasible. A tagout device (tag) may ONLY be used if:

1) Protective measures that are equivalent to lockout are used; and
2) The tag is attached to the same place a lock would be.

Remember: Tags are warning devices and DO NOT provide physical restraints.

Section 24: Lockout/Tagout

24.5 Lockout/Tagout Devices - Continued

24.5.1 General - Continued

- All Lockout/Tagout devices will be issued by the facility Maintenance Supervisor.
- Each authorized person will be issued locks, tags, multiple lock hasps or other lockout/tagout devices as deemed necessary.
- Additional locks, hasps, tags and lockout devices may be obtained from the facility Maintenance Supervisor, if required.

24.5.2 Locks

- Locks physically prevent the use of equipment or machinery.
- They must:
  - √ Be durable;
  - √ Standardized according to either color, shape or size;
  - √ Substantial enough to prevent easy removal;
  - √ Clearly identify the employee who applied them;
  - √ Be keyed individually; (The individual who applies the lock must maintain possession of the key at all times until he or she removes the lock) and
  - √ NOT be used for any other purpose.

24.5.3 Tags

- Tags provide warnings to alert workers to the status of the equipment.
- They must:
  - √ Be durable and printed so that they remain legible;
  - √ Be standardized according to print and format;
  - √ Indicate the identity of the employee who applied them; and
  - √ Include the signal word “DANGER” to warn against hazardous conditions if the machine or equipment is energized and must include a message such as:

DO NOT START...OR…DO NOT OPEN...OR… DO NOT CLOSE...

OR…DO NOT ENERGIZE...OR…DO NOT OPERATE.

- The means of attachment must be:
  - √ Non-reusable;
  - √ Attachable by hand;
  - √ Self-locking;
  - √ Non-releasable; and
  - √ Have a minimum unlocking strength ≥ 50 lbs.

Section 24: Lockout/Tagout

24.6 Training

24.6.1 General

- Employees will receive initial training or instruction in lockout/tagout procedures in accordance with their level of responsibility.
- Employees will be retrained when their job assignment changes, the Lockout/Tagout Procedures change or when an inspection indicates a lack of knowledge or deficiency in work practices.
- All pertinent employees will be trained in new or modified lockout/tagout procedures necessitated by the installation of new equipment.

24.6.2 Levels of Responsibility Include:

- **Authorized Employees** - Those who service or maintain equipment and follow Lockout/Tagout procedures. Authorized employees must be trained to:
  1) Recognize the types of hazardous energy sources;
  2) Identify the hazardous energy sources present in the workplace;
  3) Understand the danger of the energy sources present in the workplace; and
  4) Understand and follow the department's Lockout/Tagout Procedures.
- **Affected Employees** - Those who operate or use the equipment being serviced or maintained and others in the area where equipment is locked out and/or tagged out. Affected employees must receive training in order to:

1) Recognize when Lockout/Tagout Procedures are being implemented; and
2) Understand the purpose of the Procedure and the importance of not attempting to start up or use machinery or equipment that has been locked out or tagged out.

- **Other Employees -** Those who may have reason to enter or work in the area where lockout/tagout may be implemented, must be instructed about the purpose of the procedures and informed of the prohibition relating to attempts to restart or re-energize equipment which is locked out or tagged out.

Section 24: Lockout/Tagout

24.7 Periodic Program Inspections

24.7.1 Annual Inspection

- An **annual** inspection must be conducted in order to ensure that the Lockout/Tagout program and the requirements of *OSHA 29 CFR 1910.147* are being met and to correct any deviations or inadequacies that may be identified.

- An authorized and properly trained employee must perform the inspection. *Someone who is not actually performing the work must complete the inspection.*

- After the inspection or observation, the results must be reviewed with each authorized and affected employee.

- Documentation certifying the completion of the inspection must be maintained on file and include the following information:
  - √ The date of the inspection;
  - √ The identify of the machinery or equipment;
  - √ The affected and authorized employees included in the inspection;
  - √ Any deviations or inadequacies;
  - √ A plan for correction; and
  - √ The signature of the person conducting the inspection/observation.

The *Lockout/Tagout* (See Page 7) *Observation Form* may be used to record inspection. A reproducible copy of the form is found in the *Forms Section* of this Plan.

Section 24: Lockout/Tagout

24.7 Periodic Program Inspections - Continued

24.7.2 Lockout/Tagout Observation Form

Lockout/Tagout Observation Form

Date_____ **Equipment** _____

Authorized Employee(s)	Affected Employee(s)
_____	_____
_____	_____
_____	_____
_____	_____

Lockout/Tagout Procedures for Machine/Equipment Available: ‰ YES ‰ NO

Lockout/Tagout Procedures Properly Implemented: ‰ YES ‰ NO

Deficiencies Noted

_____
_____
_____
_____
_____
_____

Corrective Action(s) Recommended:

_____
_
_____
_____
_____
____
_____

Date Corrective Actions Completed:_____

Results reviewed with Authorized & Affected Personnel ‰ YES‰ NO

Authorized Observer's Signature _____

Completion of this document certifies that a Lockout/Tagout Procedure has been observed during implementation and that deficiencies have been noted.

RETAIN 3 YEARS

Section 24: Lockout/Tagout

24.8 Lockout/Tagout Procedure

24.8.1 Lockout/Tagout Form

The *Lockout/Tagout Procedure Form* may be used for all machinery or equipment subject to lockout/tagout. (See the *Forms Section* for a copy of this form.)

Lockout/Tagout Procedure Form

This Procedure must be used for the lockout/tagout of energy isolating devices whenever maintenance or servicing is done on machines or equipment to ensure that employees will not be injured by the unexpected energization or start-up of the machine or equipment or release of stored energy. All requirements contained in the Lockout/Tagout Program must be adhered to.

Date Work Began _____ **Equipment** _____ **Work to be Conducted** _____

Authorized Employee(s) **Affected Employee(s)**

_____ _____
_____ _____

Notify “affected” employees and any employees working nearby.
Shut down the equipment.

- **Identify all energy sources and possible hazards.** **(Use the Lockout/Tagout Initial Survey Form)**
- **Disconnect the power.**
- **Lock out or tag out the equipment.**
- **Neutralize other possible energy sources**
  - **Lower all suspended parts**
  - **Block movable parts**
  - **Vent air pressure from pneumatic lines**
  - **Drain or bleed hydraulic lines to remove pressure**
  - **Release or block spring energy**
  - **Secure machine products to be sure they can’t move, fall unexpectedly, etc.**
  - **Drain capacitors, and other sources of stored energy.**

ENERGY SOURCE/HAZARD	LOCKED OUT?	TAGGED OUT?	ADDITIONAL? (If Tagged Out)	ALL REMOVED
_____	YES NO	YES NO	_____	YES NO
_____	YES NO	YES NO	_____	YES NO
_____	YES NO	YES NO	_____	YES NO
_____	YES NO	YES NO	_____	YES NO

- **Test Equipment, if not energized, PERFORM SERVICE/MAINTENANCE.**
  - **Push start buttons. (TWICE) (Return to “off” or neutral position.)**
  - **Test electric circuits. (Only a “Qualified” person can do this.)**
- **After completion of work and BEFORE RESTARTING, double-check everything.**
  - **Equipment - In operating condition, lubricated, adjusted, etc. (CONTROLS ARE IN NEUTRAL)**
  - **Guards - in place**
  - **Tools - removed**
  - **Braces, pins, blocks, chains - removed**
  - **Pressure tubing, pipes, hoses - connected, with valves closed**
  - **Work area - clear**
  - **Personnel - out of danger zones**
- **Affected personnel notified of startup.**
- **Tags and locks - removed by authorized persons who installed them.**
- **Reenergize.** **Date Work Completed**

_____

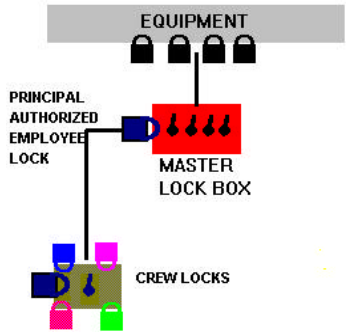
Section 24: Lockout/Tagout

24.8 Lockout/Tagout Procedure - Continued

24.8.2 Group Lockout

- Group Lockout/Tagout Procedures may be used if there are multiple locks required for a single machine or piece of equipment and several employees are involved in maintenance and servicing activities.

- In addition to all requirements previously shown in this Section, the following process must be adhered to when applying lockout devices:



  1) A principal authorized employee (PAE) applies the equipment locks;
  2) The PAE places keys to equipment locks in a master lock box and applies his personal lock;
  3) The PAE places his personal lock key in a separate lock box and each member of the crew, including the PAE, applies their personal lock; and
  4) All Lockout/Tagout Procedures are followed until the job is complete.

24.8.3 Removal of a Lockout/Tagout Device Under Special Conditions

- If an authorized person is unavailable to remove his/her lockout/tagout device, it may be removed under the direction of the facility Maintenance Supervisor provided the following conditions are met:

  1) At least two attempts are made to contact the authorized person who applied the device(s);
  2) The person is notified that the device(s) have been removed prior to his/her return to work;
  3) The Maintenance Supervisor and Lead must be present;
  4) It is determined that it is safe to start-up the machine or equipment prior to removing the lockout/tagout device.

24.9 Recordkeeping

24.9.1 Records Retention

Record	Maintained By	Retention
Lockout/Tagout Observation Form	**Environmental Health and Safety Office**	**3 Years**
Training	**Environmental Health and Safety Office**	**Most Current**
Lockout/Tagout Procedure Form	**Environmental Health and Safety Office**	**1 Year**

Section 25: Machine Guarding

25.1 Introduction

Any machine part, function, or process that may cause injury must be safeguarded. Guards must be provided where rotational motion, nip points, cutting, shearing, punching and forming mechanisms can cause injury to employees.

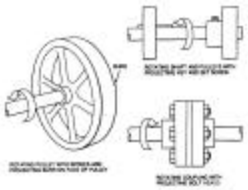
29 CFR 1910.212 29 CFR 1910.213 29 CFR 1910.219

25.2 Hazards

25.2.1 Mechanical Hazards Occur at the Following:

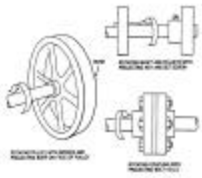
- **The point of operation** - Where work is performed on the material, for example:
  - cutting
  - shaping
  - boring
  - forming

- **Power transmission apparatus** - All components of the mechanical system which transmit energy to the part of the machine performing the work, for example:
  - flywheels
  - pulleys
  - belts
  - connecting rods
  - couplings
  - cams
  - spindles
  - chains
  - cranks
  - gears



- **Other moving parts** - All parts of the machine which move while the machine is working, such as:
  - reciprocating
  - rotating
  - transverse moving parts
  - feed mechanisms
  - auxiliary parts

25.2.2 Hazardous Motions

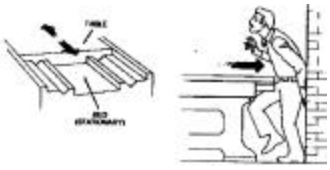


- **Rotating motion** can grip clothing and force arms, hands, or other parts of the body into danger.

  Examples: collars, couplings, cams, clutches, flywheels, shaft ends, spindles, shafting, exposed bolts, projecting keys or set screws

- **Nip Points** may occur between rotating and fixed parts and create a shearing, crushing or abrading action.

  Examples: spoked handwheels, flywheels, screw conveyors



- **Reciprocating motions** are back and forth, or up and down. An employee may be struck by, or caught between, a moving and stationary part.

- **Transverse motion** is movement in a straight continuous line. An employee may be struck or caught in a pinch or shear point by the moving part.

25.2.3 Hazardous Actions

- **Cutting** - Injuries exist at the point of operation and where flying chips or scrap material could strike the eyes or face.

  Examples: bandsaws, circular saws, boring or drilling machines, lathes

- **Punching** - Hazards occur at the point of operation where stock is inserted, held, and withdrawn by hand.

  Examples: power presses

- **Shearing** - Hazards occur at the point of operation where stock is inserted, held, or withdrawn.

  Examples: powered shears

- **Bending** - Hazards occur at the point of operation where stock is inserted, held, or withdrawn.

  Examples: power presses, press brakes, and tubing benders.

Section 25: Machine Guarding

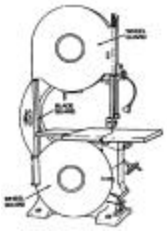
25.3 Machine Guards

25.3.1 General

- Guards must prevent any part of an employee's body from making contact with dangerous moving parts.
- The guard must be considered a permanent part of the machine or equipment and not easily or quickly removed or replaced.
- The guard must not interfere with the efficient operation or maintenance of the machine or give discomfort to the operator.
- The guard must not weaken the machine's structure.
- The guard must be designed for a specific job and a specific machine.
- The guard must be durable, resistant to fire and corrosion and easily repaired.
- The guard must not present hazards, such as rough edges, splinters, pinch points, shear points, or sharp corners.
- Guards must allow for safe lubrication of the equipment.
- Fan blades or other power transmission equipment located less than 7 feet from the working surface must be guarded. *If wire mesh is used, openings cannot exceed ½".*

25.3.2 Methods of Machine Guarding

Fixed



- **Guarding** or enclosing the operation (preferred method)
  - **Fixed** - A permanent part of the machine. This type guard may be constructed of sheet metal, screen, wire cloth, bars, plastic or any other material capable of withstanding impact and use.
  - **Interlocked** - When this guard is opened or removed, the machine shuts off or disengages and the machine cannot cycle or start until the guard is back in place.

Interlocking

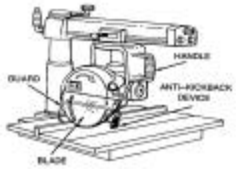
- **Adjustable -** Provides a barrier that may be adjusted to admit varying sizes of stock.

Section 25: Machine Guarding

25.3 Machine Guards - Continued

25.3.2 Methods of Machine Guarding - Continued

Self-adjusting



- **Guarding - Continued**
  - **Self-adjusting -** Provides a barrier that moves according to the size of stock entering the danger area.

- **Devices** may be used to stop the machine if a hand or body part is placed in the danger area, or to restrain or withdraw the operator's hands during operation. They may require that both hands be used to operate controls, thus keeping hands out of the danger area, or provide a barrier synchronized with the operating cycle of the machine in order to prevent entry to the danger area during the hazardous part of the cycle.
  - **Presence-Sensing Devices** - This may be a photoelectric, electromechanical, or radiofrequency device that interrupts the machine's operating cycle if hands or any part of the body are placed in the danger area.
  - **Pullbacks -** These devices use cables attached to the operator's hands, wrists and/or arms to withdraw them from the point of operation during the descent stroking action.
  - **Restraints -** These devices use cables or straps attached to the operator's hands at a fixed point. They must be adjusted to let the operator's hands travel within a predetermined safe area. *Hand-feeding tools are often necessary if the operation involves placing material in the danger area.*
  - **Safety Trip Controls -** Wires, bars or rods that provide a quick means of deactivating the machine in an emergency situation.

These type controls must be positioned to stop the machine before a part of the employee's body reaches the danger area.

- **Two-Hand Controls -** This type control requires constant, concurrent pressure by the operator to activate the machine, thus keeping the operator's hands at a safe distance from the danger area while the machine completes its cycle.

- **Gates -** This is a movable barrier that protects the operator at the point of operation before the machine cycle can be started.

Section 25: Machine Guarding

25.3 Machine Guards - Continued

25.3.2 Methods of Machine Guarding - Continued

- **Location and distance** may be used after an analysis of each machine determines that the dangerous moving parts of the machine can be located so that a hazard to the employee does not exist during its normal operation.

  - **Location -** Hazardous parts are located away from workstations or areas where employees walk or work. This may be accomplished by positioning a machine with its power transmission apparatus against a wall, or using walls or fences to restrict access. These parts may also be located at a level greater than seven (7) feet from the work surface.

  - **Distance -** A safe distance may be maintained during the feeding process if the dimensions of the stock allow the employee to hold the end not being worked at a safe distance from the point of operation.

- **Miscellaneous Aids -** Although they do not give complete protection from machine hazards, awareness barriers, shields and special tools for handling stock may be used to provide an extra margin of safety to the operator.

- **Awareness barriers -** This type aid does not provide physical protection, but is a reminder that the employee is approaching a danger area. Ropes, chains, or other type barricades may be used to signify a hazardous area.

- **Shields -** Plexiglas™ or other type shields may be installed to provide protection from flying particles, splashing cutting oils, or coolants.

- **Hand Tools -** Special tools may be used to place or remove stock from the point of operation of a machine. Holding tools and a push stick or block may be used when feeding stock into the danger area.

25.4 Training

Operators and Maintenance Personnel must receive training when assigned to a new machine and when new or altered safeguards are put into service.

25.4.1 Training should include:

- √ Identification of the hazards associated with each machine;
- √ Information regarding safeguards and how they provide protection;
- √ How safeguards should be used and why;
- √ Circumstances under which guards may be removed and by whom; and
- √ What to do if a safeguard is damaged, missing or inadequate.

Section 25: Machine Guarding

25.5 Maintenance and Inspections

- If mechanical guards are removed in order to perform maintenance, servicing or repairs, all safety precautions including the Lockout/Tagout Program must be followed.

NOTE: **ALWAYS replace guards before re-energization.**

- Safeguards must be inspected periodically to ensure that they are in place, adequate and in working condition.

25.6 Recordkeeping

25.6.1 Records Retention

Record	Maintained By	Retention

Inspections	**Supervisors and Environmental Health and Safety Office**	**12 months**
Training	**Environmental Health and Safety Office**	**Most Current**

Section 26: Materials Handling

26.1 Introduction

All employees must understand how to move objects safely by hand or with mechanical devices. They need to use safe lifting techniques and ensure that any lifting equipment is maintained in good mechanical condition.

Supervisors need to ensure that materials are not only handled safely, but also stored securely and properly in order to prevent accidents and injuries. Supervisors also need to ensure that employees review this Section and have been properly trained in proper lifting techniques, in the use of mechanical equipment and in proper materials handling procedures.

NOTE: **See the *Powered Industrial Trucks (Forklifts) Section* of this Safety and Health Plan for <u>powered</u> materials handling devices.**

29 CFR 1910.176-1910.184

26.2 Storage

26.2.1 General

- Materials must be stored so that they do not create a hazard. Containers, bags, etc. stored in tiers must be stacked, blocked and limited in height so that they are stable and secure.
- Store materials that are flammable, explosive, oxidizing or corrosive separately and in approved storage areas or cabinets.
- Traffic lanes and loading areas are to be kept clear and marked appropriately.
- Store materials in workrooms or designated storage areas only. *Do not use hallways, fan lofts, or boiler and equipment rooms as storage areas*.

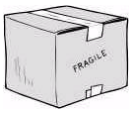
- Do not exceed the rated floor capacity of stored material for the area. *Post the load limit and the maximum height to which material may be stacked.*
- Place materials such as cartons, boxes, drums, lumber, pipes and bar stock in racks or in stable piles as appropriate for the type of material.
- Clearance of at least 18 inches must be left between the top of stacked materials and fire sprinklers or suppression equipment and electrical fixtures.

Section 26: Materials Handling

26.2 Storage - Continued

26.2.1 General – Continued

- Round objects need to be blocked or secured to prevent rolling.
- Materials are not to be stored on top of cabinets, lockers, etc.
- Objects with sharp edges or protrusions must be stored so that employees are not exposed to their hazards or barriers or protective coverings are to be used.
- Store heavier objects on lower levels; do not overload shelving and cabinets or exceed their rated capacity.
- Cartons that could be affected by moisture need to be stored on platforms.



26.3 Lifting and Moving

NOTE: ***It is recommended that mechanical devices be used for lifting and moving objects rather than manual effort whenever this is practical.***

26.3.1 Moving - Hand Trucks

- Inspect all hand trucks and pallet movers prior to each use to ensure that there are no defects and that they are in good condition.
- Wear work gloves and if necessary, steel-toed safety shoes.

- Never exceed the capacity of the equipment.
- Never carry people on a hand truck or pallet mover.
- Always walk at a normal speed, NEVER run.
- Avoid running over hoses, piping or other loose objects.
- Slow down in areas that are hazardous, such as rough terrain or slippery or wet areas.

Section 26: Materials Handling

26.3. Lifting and Moving - Continued

26.3.1 Moving - Hand Trucks - Continued

- Ensure that there is enough clearance in aisles and limited access areas.
- Avoid hitting or running into people.
- Load hand trucks and pallet movers carefully so that the load is stable. Strap down if necessary. Make sure the load is on the chisel of the truck.
- Pull a two-wheeled hand truck unless going down a ramp, and then it should be pushed.
- Avoid pinch points and keep hands in the middle of the handles or drawbars and keep feet away from the wheels.
- Store the hand truck properly after use.

26.3.2 Pallets

- Use only pallets that are in good condition. Remove defective pallets from service immediately.
- Stack unused pallets flat and in a safe place.

26.3.3 Manual Lifting Rules

- Inspect the load to be lifted for sharp edges, slivers, and wet or greasy spots. Wear gloves when lifting or handling objects with sharp or splintered edges.

- Inspect the route over which the load is to be carried. It should be in plain view and free of obstructions or spillage that could cause tripping or slipping.

- Consider the distance the load is to be carried. Gripping power may weaken over long distances.

- Size up the load to be sure that you can lift it easily, if not, GET HELP.

Section 26: Materials Handling

26.3 Lifting and Moving - Continued

26.3.3 Manual Lifting Rules - Continued

- If team lifting is required, it is recommended that employees be similar in size and build. One person needs to act as the leader to give the commands to lift, lower, etc.

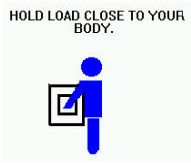
- Two persons carrying a long piece of pipe or lumber are to carry it on the same shoulder and walk in step.

26.3.3.1 To lift an object off the ground, use the following steps:


YES

1) Make sure you have good footing and set your feet about 10 to 15 inches apart. It may help to put one foot in front of the other.
2) Assume a knee-bend or squatting position, keeping your back straight and upright.
3) Get a firm grip and lift the object by straightening your knees -- **not your back**.
4) Carry the load close to your body (not on extended arms).
5) To turn or change your position, shift your feet, don't twist your back.
6) *Reverse the steps to set an object on the ground*.


NO



26.4 Truck Loading

- All objects loaded on trucks must be secured to the truck to prevent any shifting of the load in transit.
- The wheels of the trucks being loaded or unloaded at a loading dock must be chocked to prevent movement and the brakes must be set.
- Loading docks must be secured properly per the manufacturer's instructions.

Section 26: Materials Handling

26.5 Housekeeping

- Keep stairs, corridors and aisles clear.
- Do not allow exits, passageways or access to equipment to become obstructed by either stored materials or materials and equipment that is being used.

26.6 Recordkeeping

26.6.1 General

Inspection records will be maintained on file.

26.6.2 Records Retention

Record	Maintained By	Retention

Inspections: Housekeeping*	**Supervisors and Administrators**	**Most Current**
Training	**District Environmental Health and Safety Office**	**Most Current**

*See *Monthly Inspection Form*

Section 27: Medical and Exposure Records

27.1 Introduction

The following guidelines must be followed by the School Board of Brevard County and any healthcare professionals contracted by the School Board for medical and exposure issues. The records referred to in this Section pertain to employees who may have received a routine employment physical; annual physicals required by the position; or who may have been injured and/or exposed to toxic substances or harmful physical agents during the performance of their work or in the workplace itself.

29 CFR 1910.1020

27.2 General Requirements

27.2.1 Retention

- Employee *medical records* are to be maintained for duration of employment plus **30 years.**
  - Unless records relate to injuries requiring first aid treatment at the site.
  - Not required for those employed less than 1 year.

- Employee exposure records are to be maintained for at least **30 years**.

NOTE: **Background data for environmental monitoring or measuring, need only be retained for 1 year if the sampling results, methodology and sampling plan are retained.**

27.2.2 Access to Records

- Access to exposure and medical records must be provided within 15 working days to the requesting employee or designated representative.
- Employees first entering into employment **(and annually thereafter)** are to be informed of the existence, location and availability of any exposure or medical records.

- Employees first entering into employment **(and annually thereafter)** are to be informed of the name of the person(s) responsible for maintaining and providing access to these records.
- A copy of *OSHA 29 CFR 1910.1020* is to be available upon request.
- Information from an employee's health records may be disclosed only with the employee's written consent, or as required by law.

NOTE: **See the *Forms Section* of this Plan to obtain a document that will meet the annual information requirements of this Section.**

Section 27: Medical and Exposure Records

27.2 General Requirements - Continued

27.2.3 Records

- ***Employee Exposure Records Include***:
  - √ Material Safety Data Sheets
  - √ Air Monitoring Survey Results
  - √ Noise Monitoring Survey Results
  - √ Ergonomic Survey Results
  - √ Industrial Hygiene Monitoring Results
  - √ Bloodborne Pathogens Exposure Incidents

- ***Employee Medical Records Include***:
  - √ Medical/Employment Questionnaires
  - √ Results of Baseline Medical Exams
  - √ Medical Opinions, Diagnoses, Notes and Recommendations
  - √ First Aid Records
  - √ Description of Treatments and Prescriptions
  - √ Medical Complaints
  - √ Hepatitis B (HBV) Vaccination Records

27.3 Recordkeeping

27.3.1 Records Retention

Record	Maintained By	Retention
Medical Records	**Occupational Health Care Provider**	**30 Years (After the employee is no longer employed by the School Board)**
Exposure Records	**Environmental Health and Safety Office**	**30 Years (For MSDSs, 30 Years after the chemical is no longer in use)**

Section 28: Mishap Reporting and Investigation

28.1 Introduction

School Board of Brevard County employees are to report all on the job accidents or incidents that occur **no matter how minor**. Each mishap will be investigated immediately after it is reported and the factors that may have led to the incident determined. By following the procedures outlined in this section, it is our intention to prevent similar mishaps from occurring in the future.

28.2 Responsibilities

28.2.1 Principals and Facility Managers Must:

- Establish and communicate this reporting and investigation policy/procedure.
- Apply the policy/procedure consistently.
- Enforce the policy/procedure and monitor the program.
- Communicate clearly what is required.
- Ensure that a *Supervisor's Investigation Report* is completed, reviewed for accuracy and forwarded to the District Safety Officer.

28.2.2 District Safety Coordinator

- In addition to the responsibilities shown in Section 28.2.1, the District Safety Officer must also:
  - Implement immediate, temporary control measures as necessary;
  - Initiate the accident investigation process for all accidents;
  - Review *Supervisor's Investigation Report* for accuracy; and
  - Recommend corrective actions.

28.2.3 Supervisors Must:

- Investigate accidents/incidents before the end of the work shift where the mishap occurred and prepare the *Supervisor's Investigation Report.*

28.2.4 Site Safety Committees Must:

- Review *Supervisor's Investigation Report* and recommend corrective actions.

- Forward information quarterly to the Executive Safety Committee (ESC).

28.2.5 Executive Safety Committee (ESC) Must:

- Review information provided to them by the Site Safety Committees (SSCs) and evaluate the recommendations.

Section 28: Mishap Reporting and Investigation

28.2 Responsibilities - Continued

28.2.6 Risk Management Office Will:

- Complete the *First Report of Injury* for all incidents involving an occupational injury or illness and submit it to the workers' compensation insurance carrier within 7 working days.
- Complete the *SAF 200 Log,* if the injury or illness is recordable as defined by the State of Florida.
- Report to the OSHA within 8 Hours, if a fatality or hospitalization of three (3) or more employees occurs.
- Maintain the *Supervisor's Investigation Report*, the *First Report of Injury* and *SAF 200 Log* on file for five (5) years plus the current year.
- Prepare statistical reports as required and route to all Principals, Facility Managers, the District Safety Coordinator and the Executive Safety Committee for review.

28.2.7 All Employees Must:

- Notify their supervisor **immediately** when an accident/incident occurs.
- Be proficient in safe job performance and obey all safety rules.
- Recognize work place hazards and report them to their immediate supervisor either verbally or through the *Hazard Recognition Program*.

28.3 The Investigation Process

All mishaps, no matter how minor, must be investigated. Even those accidents or incidents that are considered minor often involve hazards that could cause serious injury if those hazards are not identified and eliminated. One-time first aid injuries, minor property or equipment damage and incidents with high potential for serious injury or "near misses" must be documented and investigated in order to prevent future, more serious injuries or accidents.

28.3.1 Investigation Responsibilities

1) One-time first aid injuries and minor equipment or property damage will be investigated, as necessary by the Environmental Health and Safety Office, or by the Site Safety Committee.
2) Each supervisor or school administrator will investigate near misses.
3) The supervisor or District Safety Officer will investigate lost-time or recordable injuries and other than minor property damage.
4) Major accidents involving a fatality or multiple injuries, will be investigated by an investigator/team assigned by the Superintendent.
5) The Public Safety Transportation Services Department will normally investigate all School District motor vehicle mishaps.

Section 28: Mishap Reporting and Investigation

28.3 The Investigation Process - Continued

28.3.2 Investigative Goals

- **Attempt to determine**:

1) The direct cause of the accident;
2) The indirect or root cause; and
3) How to prevent future occurrences of similar mishaps.

- **The direct cause of a mishap could Include**:
  - Being struck by or against something;
  - Slips, trips or falls;
  - Being caught in or between objects;
  - Exposure through inhalation, ingestion or absorption;
  - Exposures to temperature extremes;
  - Contact with electrical current; or
  - Overexertion.

- **Determination of indirect or root causes:**

1) **Was a Hazardous Condition(s) a Contributing Factor**
   - √ Defective equipment/tools/materials?
   - √ Was the hazardous condition recognized prior to operation?
   - √ Was it reported?
   - √ Was employee informed of hazardous conditions and instructed in safe work procedures?
   - √ Was equipment inspected prior to use?
   - √ Was the hazardous condition detected during the inspection?
   - √ Was the correct equipment/tools/materials used?
   - √ Was the correct equipment/tools/materials available?
   - √ Did the employee know where to obtain equipment/tools/material?
   - √ Was substitute equipment equipment/tools/materials used?
   - √ Did the design of the equipment/tools create stress or encourage operator error?

- √ Did the general design of the equipment/tools contribute to a hazardous condition?

2) Was the Location/Position of the Equipment/Materials/Employee a Contributing Factor?

- √ Did the location/position of equipment/material/employee contribute to a hazardous condition?
- √ Was the hazardous condition recognized?
- √ Was it reported?
- √ Was the employee told of job procedures for dealing with the hazardous condition as an interim action?
- √ Was the employee supposed to be in the vicinity of the equipment/material?
- √ Were environmental conditions a contributing factor? *(Noise, Illumination, Air Contaminants, Temperature Extremes, Ventilation, Vibration, Radiation, etc.)*

Section 28: Mishap Reporting and Investigation

28.3 The Investigation Process - Continued

28.3.2 Investigative Goals - Continued

- **Determination of indirect or root causes: - Continued**

3) Was the Job Procedures(s) used a Contributing Factor?

- √ Was there a written or known procedure for this job?
- √ Did job procedures anticipate the factors that contributed to the accident?
- √ Did the employee know the job procedure?
- √ Did the employee deviate from the known job procedure?
- √ Was the employee mentally and physically capable of performing the job?
- √ Was the PPE adequate?
- √ Was emergency equipment specified for this job (eyewash, fire extinguisher)?
- √ Was emergency equipment readily available?
- √ Was emergency equipment properly used?
- √ Did emergency equipment function properly?

4) Was a Management System Defect a Contributing Factor?

- √ Was there a failure by supervision to detect, anticipate, or report a hazardous condition?
- √ Was there a failure by supervision to detect or correct deviations from a job procedure?
- √ Was there a supervisor/employee review of hazards and job procedures for non-routine tasks?
- √ Was the supervisor responsibility and accountability adequately defined and understood?
- √ Was the supervisor adequately trained to fulfill assigned responsibility in accident prevention?
- √ Was there a failure to initiate corrective action for a known hazardous condition that contributed to accident?

28.3.3 An Accident Investigation Kit should be available and include:

Emergency Call Number List
Supervisor's Investigation Report
Barricade Tape
Camera
(Disposable)

Clipboard
Sketchpad
Pencil or Pen
Chalk
Tags (Warning)

Accident Kit

Envelopes/Bags (For Items found during the investigation)
Tape Measure

Section 28: Mishap Reporting and Investigation

28.3 The Investigation Process - Continued

28.3.4 Reporting and Investigative Steps

- ***Employee***

  1) Initiates Emergency Procedures, if necessary; and
  2) Reports mishap to supervisor, immediately.

- ***Supervisor***

  3) Ensures that all injured are assisted and evacuates contaminated/hazardous area, if required;
  4) Notifies Principal or Facility Manager or utilizes the Emergency Call List;
  5) Implements Emergency Evacuation Procedures if necessary;
  6) Investigates mishap if other than one-time first aid or if it is a major accident as identified in 28.3.1, item 4;
  7) If required, prepares *Supervisor's Investigation Report* and forwards to the Principal or Facility Manager before the end of the shift.

- **Principal or Facility Manager**

  8) Notifies Safety Coordinator of mishap; and
  9) Reviews and forwards *Supervisor's Investigation Report.*

- **Safety Coordinator**

10) If required, investigates or coordinates Investigation, after notification;
11) Reviews and forwards *Supervisor's Investigation Report* to Site Safety Committee (SSC).

- **Risk Management**

12) Notifies OSHA within 8 hours, if there is an employee fatality or 3 or more hospitalizations;
13) Completes the *Notice of Injury*, if required, and forwards to the workers' compensation insurance carrier; and
14) Completes the *SAF 200* Log if the injury or illness is recordable per the State of Florida guidelines.

- **Assigned Investigator**

15) Secures area - tags defective equipment "Out of Service";
16) Does not allow entry into area until it is declared safe;
17) Recovers and records short term evidence; *(Equipment readings, Names of persons involved)*
18) Sketches and photographs area; (If applicable)
19) Thoroughly searches area and bags evidence found; (If applicable)
20) Interviews witnesses;
21) Completes *Supervisor's Investigation Report* and routes as required. (i.e.; Safety Committee, Principal or Facility Manager)
22) Initiates immediate abatement if extremely hazard condition exists.

Section 28: Mishap Reporting and Investigation

28.3 The Investigation Process - Continued

28.3.4 Reporting and Investigative Steps - Continued

- **Site Safety Committee**

23) Reviews *Supervisor's Investigation Report*, and makes abatement recommendations;
24) Forwards recommendations to District Safety Coordinator and facility Principal or Manager;
25) Includes information in quarterly report to the ESC.

- **Safety Coordinator, Principals and Facility Managers**

26) Monitors abatement process and ensures that corrective actions are taken;
27) Forwards report to Site Safety Committee after completion of all corrective actions.

- **Site Safety Committee**

  28) After review of corrective actions, forwards report to Risk Management.

- **Risk Management**

  29) Files completed *Notice of Injury*, *Supervisor's Investigation Report,* safety committee recommendations and corrective actions.

28.4 Reporting

28.4.1 Supervisor's Investigation Report

A *Supervisor's Investigation Report* must be completed and submitted for each mishap investigated before the end of the shift where the mishap occurred. See the *Forms Section* for a sample form

The following information is required:

1) The specific nature of the injury or illness. For example: cuts, burns, strains, sprains, dermatitis, etc.
2) The source of the accident, or the object or substance, which inflicted the injury or illness. For example: overhead crane, table saw, electric drill, etc.
3) The source part or the part of the object or substance that created the hazard and caused the accident. For example: hook, blade, plug, etc.
4) The hazardous condition. For example: hook safety latch missing, saw blade cracked, ground prong missing from plug.
5) The unsafe act, or what was done wrong or not done at all. For example: failure to inspect equipment before use, using unsafe equipment.
6) The unsafe personal cause is the physical or mental reason why an employee committed an unsafe act. For example: lack of knowledge or skill, physical/mental defects, improper attitude, etc.

Section 28: Mishap Reporting and Investigation

28.4 Reporting - Continued

28.4.2 First Aid Logs

A record of first aid cases should be maintained and reviewed to determine the cause of minor injuries in order to prevent a reoccurrence or escalation to more serious injuries.

28.4.3 Near Misses

Near misses, or incidents that could have caused significant injuries or illnesses, must be investigated to determine whether such incidents could lead to more serious or repeated accidents. These reports will aid in identifying and eliminating unsafe or hazardous conditions.

28.4.4 Trend Analysis Reports

All information documenting accidents, injuries or illnesses must be summarized into a statistical report form and provided to Principals, Facility Managers, supervisors and employees in order to keep them informed regarding the effectiveness of the School Board's safety programs, policies and procedures.

This information will also be used to evaluate the program and to identify areas where current safety policies and procedures are most and least effective. Based on these reports, the Safety Program can be updated and improved to provide the greatest level of safety for all School Board employees.

28.5 Recordkeeping

28.5.1 Retention

Record	Maintained By	Retention
Supervisor's Investigation Report	**Risk Management and Safety Officer**	**5 Years + Current**
First Aid Logs	**Facility Administration**	**12 Months**
Near Miss Reports	**Safety Officer**	**12 Months**
Trend Analysis Reports	**Risk Management and Safety Officer**	**5 Years**
First Report of Injury	**Time Keeping, Risk Management and Safety Officer**	**5 Years + Current**
Safety Committee Recommendations	**Safety Officer**	**3 Years + Current**

Section 29: Occupational Health

29.1 Introduction

In order to ensure that employees are assigned to duties that they are physically able to perform and to assist in maintaining a healthy and safe work environment, the following programs are available to applicants and employees.

29 CFR 1910.95 29 CFR 1910.151 29 CFR 1910.1020 Applicable Sections of Subpart Z, 29 CFR 1910.1000-1450

29.2 Occupational Exposures

29.2.1 General

- Potential occupational exposures to hazardous situations or agents are to be investigated on a continuing basis by Principals, Facility Managers and the Environmental Health and Safety Office.

- A list of hazardous substances will be compiled and maintained in the Hazard Communication Program at each facility and operations are to be reviewed to determine if the potential for overexposure to employees exists. When it is determined that there is a real possibility of overexposure to hazardous substances, adequate protection is to be implemented **immediately** and monitoring to gather data will be initiated.

29.2.2 Industrial Hygiene Monitoring

- Various sampling methods, such as detector tubes, sampling pumps and badges can be used to determine the level of exposure.

- If monitoring indicates levels of exposure to employees in excess of the OSHA Permissible Exposure Limits (PELs) or NIOSH Threshold Limit Values (TLVs), controls are to be initiated **immediately.**

- Engineering controls should be the first option followed by the establishment of safe work precautions. If the implementation of these controls is not feasible or effective, appropriate personal protective equipment (PPE), as determined by the *Personal Protective Equipment Assessment* will be provided.

Section 29: Occupational Health

29.3 Medical Evaluations

- The following medical evaluations may be required by the School Board of Brevard County:

  1) ***Post Offer/Pre-Employment Physical*** - to establish baseline health status and fitness for duty.

  2) ***Return to Work Physical*** - to determine fitness for duty after an extended absence related to an injury or illness.

  3) ***Medical Surveillance*** - for job-related physicals such as:
     Respiratory Protection Medical Evaluations
     Asbestos
     Cadmium
     Lead
     Emergency Responders

  4) ***Department of Transportation (DOT)*** - for bus drivers and those required to have a Commercial Drivers License (CDL).

  5) ***Hearing Tests*** - annual audiograms need to be given to all employees who are exposed to noise at or above 85 dBA TWA_8.

  6) ***Termination Physicals*** - for those with occupational exposure to regulated substances as shown above.

- Medical evaluations are to be performed by a contracted physician selected as the health care provider for employees by Environmental Health and Safety and the School Board of Brevard County.

29.4 On Site Medical Aid

- First aid kits are to be maintained at each location for treatment of minor injuries not requiring medical care. First aid kits located in schools must remain under the supervision of an adult but be made available to pupils at all times while school is in session. First aid kits are to be inspected **monthly** and contain sufficient quantities and types of items necessary for routine first aid, in addition to a first aid manual or instruction guide.

- Employees trained and certified in First Aid/CPR are to be available on each shift at each location to render first aid in an emergency if a medical infirmary, hospital or treatment facility is not nearby or reachable within 4-6 minutes.

Section 29: Occupational Health

29.5 Occupational Injury/Illness

If an occupational injury or illness occurs and requires medical attention, treatment is to be coordinated through Health First Occupational Clinic in accordance with workers' compensation laws. ***Every injury sustained while performing assigned tasks, no matter how minor, must be reported to the employee's supervisor.***

- √ An occupational injury or illness is one, which results from a work accident or from an exposure involving an incident in the workplace. If medical treatment is required, the employee will be referred to a private contracted occupational injury medical provider.
- √ Standard procedures for medical treatment for the ingestion of poisons, eye injuries, burns, cardiac arrest, etc., are to be followed.
- √ If an employee cannot be removed from the site of the injury, primary aid is to be rendered by emergency medical personnel.
- √ Employees who are injured severely or become seriously ill at work are to be transported to the hospital in an ambulance, except when the School Board of Brevard County specifically approves other transportation.

29.6 Recordkeeping

29.6.1 General

Complete medical records are to be maintained for each employee from the time of the first examination. These records are to be protected as **confidential information** and remain in the custody and control of the contracted health care provider. Information from an employee's health record may be disclosed only with the employee's written consent, or as required by law. These records are to be retained for the duration of employment, **plus 30 years**.

29.6.2 Records Retention

Record	Maintained By	Retention
Medical Records	**Contracted Healthcare Provider**	**Duration of Employment + 30 Years**

Industrial Hygiene Monitoring Reports (Exposure Records)	**Environmental Health and Safety**	**30 Years**

Section 30: Office Safety

30.1 Introduction

Although offices are not normally considered a high hazard environment, accidents can and do occur. This Section identifies the typical hazards that are found in an office environment along, with the precautions that need to be taken to ensure a safe workplace.

General Duty Clause - OSH Act 5(a)(1)

30.2 Office Hazards

30.2.1 Typical office hazards may include:

1) Slips, trips and falls
2) Fire
3) Electrical shock
4) Lack of illumination
5) Poor ventilation
6) Unstable file cabinets
7) Cuts, abrasions, etc.
8) Repetitive motion injuries

30.3 Safe Work Procedures

30.3.1 To Prevent Slips, Trips and Falls

- Remove boxes, trash and equipment from walkways and passageways.
- Keep aisles clear of obstructions, slipping and tripping hazards, etc.
- Clean up spills **immediately**.
- Ensure that rugs lie flat and are slip-resistant.
- Use handrails when ascending or descending stairs.
- **NEVER** string cords or wires across the floor.
- Use caution when stepping into aisles from office doors. **BE ALERT!**
- When using two-way doors, avoid striking other people approaching from the opposite direction. **OPEN DOORS SLOWLY!**
- Use a ladder or step stool to retrieve items out of reach. **NEVER STAND ON FURNITURE!**

- Never block your view by carrying large items. Use a hand truck or carry smaller loads.

Section 30: Office Safety

30.3 Safe Work Procedures - Continued

30.3.2 To Prevent Electric Shock

- Never use equipment with frayed or damaged cords.
- Do not plug multiple electrical cords into a single outlet.
- Do not use extension or power cords that have the ground prong removed.
- Ensure that all electrical outlets, receptacles or openings are covered.
- Do not run cords under carpeting.

30.3.3 Fire Prevention

- Smoke only in designated areas.
- Do not place matches, cigarettes or smoking materials in trash containers.
- Know the location of all fire extinguishers.
- Know the emergency evacuation route and procedures (See the *Emergency Response Section*).
- Do not store flammables in the office area.
- Investigate burning odors **immediately**.

30.3.4 Lack of Illumination

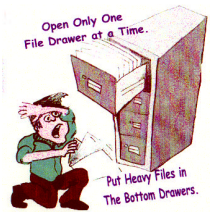
- Use direct lighting in work areas.
- Lighting needs to be adequate; replace burned out bulbs.

30.3.5 Poor Ventilation

- Ensure that the air is circulating and that work processes do not contaminate it.
- Use adequate ventilation when using chemicals. Refer to the MSDSs.

30.3.6 File Cabinets

- Open only one file drawer at a time. Close the filing cabinet drawer you are working in, before opening another filing drawer in the same cabinet.
- Use the handle when closing doors, drawers and file cabinets.
- Put heavy files in the bottom drawers of file cabinets.
- Do not place books, boxes or other material on top of file cabinets, etc.



Section 30: Office Safety

30.3 Safe Work Procedures - Continued

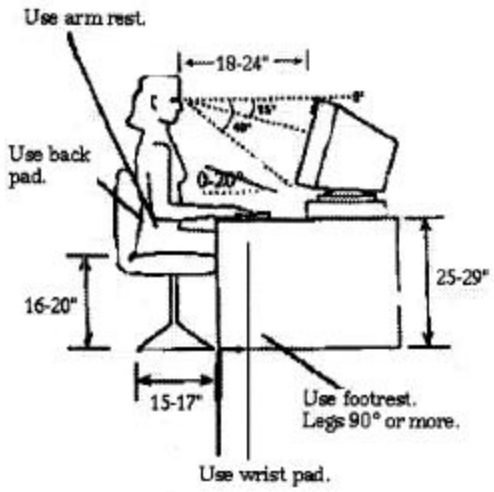
30.3.7 Cuts, Abrasions, etc.

- Store sharp objects, such as pens, pencils, letter openers, thumb tacks or scissors in drawers or with the points down in a container.
- Carry sharp objects with the tips pointing down.
- Use extreme caution when using paper-cutting machines.
- Use knives, scissors or shears with care.
- If utility knives are used, always cut in such a manner that a slip would not result in an injury. When not in use, keep in their container.

30.3.8 Repetitive Motion Injuries

- Adjust the height of the chair so that thighs are horizontal, feet rest flat on the floor and arms and hands are comfortably positioned at the keyboard.
- If chair is too high, use a footrest.
- Adjust the backrest so it supports the lower back and fits the curvature of the spine.
- Position the monitor screen to minimize glare. Use an anti-glare filter if necessary.
- The screen should be slightly below eye level when sitting at the keyboard.
- Draw drapes or adjust blinds to reduce glare.

- Position the document holder close to the screen and at the same level and distance from the eye to avoid constant changes of focus.
- Rotate position of document holder to opposite side periodically.
- Change position, stand up and stretch whenever you begin feeling fatigued.
- Keep hands and fingers relaxed and the wrists and body in a neutral position when typing. TAP THE KEYS LIGHTLY!
- Rotate tasks that require repetitive motion such as manual stapling, mail sorting, etc.
- Eliminate flexed neck when sitting at the terminal screen.
- Elbows should be bent to a 90° angle when hands are on the keyboard.



- Wrists should be neutral. Use wrist rests at the edge of keyboard for support.

Section 31: Playground Safety

31.1 Policy

In the continuing effort to provide quality, well-maintained, clean and safe playgrounds and facilities for students, the School Board of Brevard County has developed the following standard operating procedures to protect and preserve its playground facilities and its users. This program will assure that every attempt will be made to eliminate playground hazards, while not totally eliminating the element of risk which is an essential part of any successful children's play and learning environment.

***Handbook for Public Playground Safety*, U.S. Product Safety Commission, 1994**

31.2 Responsibilities

31.2.1 School groups wishing to purchase, construct or install play equipment shall:

- Submit a *Playground Equipment Procurement and Installation Approval Form* to the District Playground Safety Coordinator before any purchase. This should be submitted with plans, type of equipment and schematics of proposed playground.
- Fund all design equipment, construction, installation tasks and surface material.
- New playground installations shall be in accordance with the Americans with Disabilities Act of 1990. All new playgrounds will be required to purchase engineered ADA compliant mulch, such as Fibar, Kids Carpet or GT Impax Fibar. Rubberized ADA compliant surfaces are acceptable as well.
- Verify that proposed equipment meets the *U.S. Consumer Products Safety Commission Guidelines (Handbook for Public Playground Safety)* and is IPEMA certified to ASTM F1487.
- Obtain detailed pictures, drawings, installation instructions, guidelines for use, and maintenance instructions from the manufacturer.
- Contact the District Playground Safety Coordinator to review equipment and plans. (Do not contact Grounds Supervisor without review first.)
- After equipment and grounds approval, contact the District Maintenance Grounds Supervisor for site analysis and to schedule site preparation after Playground Safety Coordinator review.
- Inform and coordinate installation, construction, and inspection through the District Playground Safety Coordinator.
- Inform District Playground Safety Coordinator after the completion of installation to allow for final inspection of new equipment before children are allowed to play.
- Maintain records of installation and maintenance for inspection and audit purposes.

31.2.2 The District Shall:

- Complete an initial inspection of the site plans review.
- Provide inspectors to **annually** inspect all play equipment and sites.
- Perform routine maintenance, such as replacement of swing seats, chains, addition of surface material and other maintenance.
- Assist in the selection of equipment.
- Conduct inspections upon request by the administration.
- Excavate sites and complete the installation of ground surface material.

- Perform inspection after playground is complete.

31.2.3 The School or School Based Group Shall:

- Follow these playground policies and procedure guidelines in selecting and installing equipment.
- Fund the purchase of the playground equipment, the installation and the authorized ground surface material.
- Maintain any additional equipment purchased after the original equipment.
- Inspect **daily** to insure proper impact material thickness.
- Conduct **daily** inspections on all play equipment and sites. (See the *Forms Section* for a sample form.)
- Keep inspection records for inspection and audit purposes.
- Have the children use age appropriate play equipment.
- Prepare DCR's (*Distribution Center Request Form*) for playground equipment that has been identified as damaged or obsolete.
- Have major components that are damaged, repaired or replaced.
- Remove trash, animal litter and other hazardous materials from playgrounds **daily**.
- Level surface materials or prepare work order requests for additional material as needed.

31.2.4 Playground Supervision:

- It is important that playground activities always be supervised and that those who are assigned such duties remember the following:
  - Stay alert and attentive – move around the area, stay involved and focus on the children.
  - Be aware of the age-appropriateness of equipment and direct children to equipment recommended for their ages and development.
  - Evaluate any noticeable hazards that could cause serious injuries and report or remove them.
  - Know playground safety rules.
  - Keep an eye out for unsafe behavior.
  - Know what to do if an accident occurs on the playground.

31.3 Guidelines

31.3.1 General Requirements:

- All playground sites will be subject to the playground safety policies and procedures of the School Board of Brevard County.
- All equipment shall be installed according to the manufacturer specifications and manufacturer certified installer.
- The School Board of Brevard County shall provide reasonable resources to ensure prudent and timely inspections and repairs as determined necessary by the playground policies and procedures program.
- All play equipment shall be inspected, repaired and maintained.
- All playground equipment purchasers, installers, inspectors and maintenance employees performing repairs shall be trained in accordance with the School Board's playground safety

program in order to maintain the playground equipment in compliance with the current standard of care.

- All equipment shall be purchased from an International Playground Equipment Association **(IPEMA)*** certified to ASTM F1487 playground equipment manufacturer with adequate product liability insurance.

***IPEMA Certification – Third party voluntary certification program of a manufacturer's compliance with the current ASTM Standard. IPEMA Member does not mean that the equipment is certified and tested to ASTM F 1487 Standards. Equipment must be IPEMA Certified to ASTM F1487.**

31.4 ADA Proactive Approach

- The ADA and Playground Committee meets monthly to evaluate current needs and future legislation. This committee has decided that all new playgrounds must meet ADA accessibility requirements, as should any updates to current facilities.
- Any playgrounds not meeting ADA Compliance in both equipment and surfacing that should acquire special needs students, should contact Eva Lewis, Kim Riddle or Richard E. Smith for help with these issues.

31.5 Inspections

- **Daily inspections** are to be made by school administration to ensure that equipment does not pose any imminent danger during daily operations.
- **Look for:**
    - ***Exposed screws and bolts*** – caps missing
    - ***Sharp edges*** where parts fit together
    - ***Open-ended hooks*** – especially "S" hooks
    - ***Inadequate surfacing***
    - ***Protruding wires -*** broken fences and backstops
    - ***Splintering wood***
    - ***Tripping hazards***
    - ***Improper anchoring***
    - ***Guardrails (if required)*** - in place

- **Annual inspections,** with a re-inspection 6 months later are currently conducted by trained inspectors.

- If broken or non-compliant equipment is observed, during daily inspections, school administrators should call the Environmental Health and Safety Office and report the danger to the safety officer. An inspector will be sent out immediately.
- Unsafe equipment will be condemned and removed immediately, if inspected and found to be an imminent danger to the children and beyond economic repair.

31.6 Condemnation of Playground Equipment

- Equipment that is inspected and found to be an imminent danger, certified high risk and dangerous by the Consumer Product Safety Commission (CPSC) and beyond economic repair will be condemned and removed immediately by ground maintenance. Any play equipment not meeting current U.S. CPSC standards should be removed from play areas using the following procedure:
  - Inspection
  - Recommendation for removal
  - Preparation of DCR
  - Send DCR work request through District Office of Warehouse Services
  - Removal

31.7 Routine Maintenance

Routine maintenance will be performed on an as needed basis by the school custodial staff or appointed employee on site to insure the integrity of impact absorbing material and structures.

31.8 Contacts

All questions, recommendations and plans review should be addressed to the School District's Playground Safety Coordinator and Safety Officer, Richard E. Smith at 633-3496. EHS inspectors will review plans with schools and advise on any safety and ADA accessibility issues. After installation, the playground will be inspected for construction, impact material integrity and thickness according to ASTM 1487-98 (American Society for Testing Materials) and CPSC (Consumer Product Safety Commission) standards.

31.9 Training

31.9.1 Requirements

- The Environmental Health and Safety Team requires playground inspectors be certified and licensed through the National Playground Safety Institute (NPSI).
- All Safety to Life Inspectors will be required to take the NPSI test as available and be designated Certified National Playground Safety Inspectors.
- Initial playground safety training will be provided to custodial and maintenance staff by the District Playground Safety Coordinator's current Playground Safety Training videos and handouts. Forward the training roster to the EHS office after completion for audit purposes.
- Physical Education teachers will be trained with current Playground Safety Training videos and handouts and encouraged to complete the NPSI Inspector Training as well. Forward the training roster to the EHS office after completion for audit purposes.

31.10 Recordkeeping

31.10.1 Records Retention

Record	Maintained By	Retention
Annual Inspections	**EHS Office / Fire safety and Sanitation Inspectors / NPSI Certified**	**2 Years**

Daily and Monthly Inspections	**School Administrator or designee**	**2 Years**
Installation and Maintenance Records	**School Administrator**	**Life of Equipment**

Section 32: Personal Protective Equipment (PPE)

32.1 Introduction

Personal protective equipment (PPE) includes all clothing and other work accessories designed to create a barrier against workplace hazards. PPE is used along with:

- Engineering controls
- Safe work practices
- Administrative controls

All School Board of Brevard County employees are required to wear personal protective equipment (PPE) as determined by a PPE assessment, to provide protection from job hazards not eliminated by the use of engineering controls, safe work practices or administrative controls.

29 CFR 1910.132-138

32.2 PPE Assessment

In order to select the appropriate PPE, the workplace is to be evaluated to determine what hazards exist that could cause injury or impairment to employees. ***This assessment is to include an evaluation of injury and/or accident data as well as a walk-through survey to identify:***

1) Sources of motion
2) Sources of high temperatures
3) Chemical exposures
4) Harmful dust
5) Light radiation
6) Falling objects or potential for dropping objects
7) Sharp objects
8) Rolling or pinching objects
9) Electrical hazards
10) High noise areas

An assessment is to be completed and maintained on file. The form must include the date and signature of the person who certifies that the assessment has been completed. A sample PPE Assessment may be found in the *Forms Section* of this Plan.

32.3 Responsibilities

32.3.1 Principals, Facilities Managers or their Designees

- Provide suitable equipment to protect employees from hazards in the workplace.
- Provide information indicating what PPE is required for each task.

- Provide training to employees who must use PPE, before initial use and as required thereafter.
- Ensure that PPE is not used as a substitute for engineering controls.
- Indicate by signs and training when PPE is to be worn.

32.3 Responsibilities - Continued

32.3.2 Supervisors

- Obtain the required protective equipment and issue it to those who work with operations and materials that may require its use to ensure their safety and health.
- Ensure that employees use the required protective equipment and demonstrate the knowledge and ability to use it properly, as indicated during training sessions.
- Identify when policies may need to be updated.
- Determine when retraining may be required.
- Maintain a supply of personal protective equipment that may be needed for infrequent or special tasks.

32.3.3 Employees

- Wear PPE at all times, as required.
- Inspect PPE for damage or defects before each use.
- Keep PPE clean and sanitary.
- Immediately obtain replacements for PPE that is damaged or defective.

DAMAGED OR DEFECTIVE PPE MUST NEVER BE WORN!

32.4 PPE Requirements

32.4.1 Eye and Face Protection (OSHA 29 CFR 1910.133)

- **Is to be worn if there is a reasonable risk of injury such as flying objects, molten metal, hazardous chemicals or injurious radiation**.

Safety glasses with side and top shields are to be worn as protection against flying particles or chemical exposure, as well as when handling high pressure cylinders or using power tools.

Faceshields need to be worn when hazards exist to the face and eyes such as mixing chemicals or use of any liquids that could damage the face or eyes.

Safety goggles specifically designed to protect against anticipated hazards are to be provided as needed. They need to be worn when using grinding wheels, welding, handling chemicals, and working in dusty atmospheres or any other activity where complete eye coverage is necessary to ensure safety.

PROTECTIVE EYE AND FACE DEVICES MUST MEET *ANSI A87.1-1989*.

32.4.2 Foot Protection (OSHA 29 CFR 1910.136)

- **Foot protection must be worn when hazards exist from falling or rolling objects, sharp objects, molten metal, hot surfaces and wet slippery surfaces.**

Steel-toed safety shoes are to be worn by all employees as determined by the hazard assessment, as protection against falling and rolling objects, as well as possible punctures. *(Example: loading or unloading materials, handling cylinders, lifting heavy materials, etc.)*

Shoes with slip-resistant soles are to be worn by all employees who work in areas where wet, slippery work surfaces are a hazard.

Chemical-resistant boots need to be worn when working with caustics, acids or other corrosive chemicals.

SAFETY SHOES MUST MEET *ANSI Z41-1991*.

Employees who work around exposed electrical wires or connections need metal-free non-conductive shoes or boots.

32.4.3 Hand Protection (29 CFR 1910.138)

Gloves need to be worn to protect hands from harmful substances and temperature extremes as well as cuts, lacerations, abrasions, etc.

General purpose work gloves provide minor protection against abrasions, cuts, punctures and minor temperature exposures. *(Example: handling cylinders, metal, wood, etc.)*

Chemical-resistant gloves need to be worn to prevent chemical contact with and absorption of hazardous chemicals into the body. The appropriate glove needs to be used for each type of chemical. *(Examples: nitrile for solvents and butyl rubber or natural rubber for caustics, etc.)*

Leather gauntlet gloves need to be worn when welding or cutting or for protection against temperature extremes.

Consult the MSDS and the glove and chemical manufacturer for assistance in determining the appropriate glove to be used for a particular chemical.

32.4.4 Respiratory Protection (OSHA 29 CFR 1910.134)

Appropriate respiratory protection will be provided when employees may be exposed to possible toxins, air contaminants or oxygen-deficient atmospheres (less than 19.5% Oxygen). All requirements and responsibilities, as prescribed by *ANSI 288.2-1980, Standard Practices for Respiratory Protection* and *OSHA 29 CFR 1910.134*, must be met as shown in the *Respiratory Protection Section* of this Plan.

32..4.5 Electrical Protective Equipment (OSHA 29 CFR 1910.137)

Electrical gloves, insulated mats, blankets, etc. are to be worn or used, if necessary, to protect the employee from exposure to electrical shocks or burns.

37 Equipment is to be inspected for damage before each shift's use and immediately following any incident that might have caused damage. Insulating gloves must be air tested.

38 All electrical insulating equipment must be certified according to the American Society for Testing and Materials (ASTM).

Electrical equipment must be tested and certified by an approved laboratory per the table below and records maintained on file:

Table I-6. - Rubber Insulating Equipment Test Intervals

Type of equipment	***When to test***
Rubber insulating line hose	Upon indication that insulating value is suspect.
Rubber insulating covers	Upon indication that insulating value is suspect.
Rubber insulating blankets	Before first issue and every 12 months thereafter[1].
Rubber insulating gloves	Before first issue and every 6 months thereafter[1].
Rubber insulating sleeves	Before first issue and every 12 months thereafter[1].

Footnote[1]: If the insulating equipment has been electrically tested but not issued for service, it may not be placed into service unless it has been electrically tested within the previous 12 months.

32.4.6 Head Protection (29 CFR 1910.135)

Hard hats (protective helmets) are to be worn when there is a danger of injury to the head from falling or striking objects or when working near exposed electrical conductors which could contact the head.

The following are the new ANSI classifications; only Class E may be used for electrical work:

- *Class G (General)*
- *Class E (Electrical, Non-Conductive)*
- *Class C (Conductive)*
- *Class D (Firefighting)*

HARD HATS MUST MEET *ANSI Z89-1-1997.*

32.4.7 Protective Clothing

Protective clothing, which may include suits, coveralls, coats, boots and aprons need to be provided as necessary to provide protection against exposure to the specific hazards that may be encountered during the performance of the employee's duties. *(Examples: welding, spray painting, chemical handling, exposure to bloodborne pathogens, emergency response, etc.)*

32.4.7.1 General Rules

- Jackets, vests, aprons, sleeves, coveralls and full body suits are made for protection from hot metals, chemicals, liquids, cuts, acids and radiation.
- Heat-resistant materials, such as leather, are used to guard against dry heat and flame.
- Rubber or rubberized fabrics, such as neoprene and plastics, give protection against some acids and chemicals.
- Disposable, synthetic suits provide protection from dust, fibers and some non-hazardous chemical splashes.
- A fully encapsulating chemical suit may need to be worn if a substance is extremely toxic.

See *the Bloodborne Pathogens*, *Emergency Response*, *Welding Safety* and *Chemical Safety Sections* of this Plan for more specific information regarding protective clothing requirements.

32.5 Maintenance of PPE

- All PPE must be inspected prior to each use for damage.
- All PPE is to be properly fitted.
- Defective PPE needs to be replaced **immediately**.
- PPE is to be cleaned and maintained in a sanitary condition.
- PPE that is contaminated with toxic or corrosive chemicals must either be carefully cleaned (decontaminated) or discarded.

32.6 Training

Employees are to be trained before the initial use of PPE and as the need for additional training is indicated. A certified record containing the name of the employee, the date of the training, the instructor's name and the specific PPE covered, is to be kept on file.

32.6.1 Training shall include at a minimum:

37 When PPE is necessary;

38 What PPE is necessary;
39 How to properly put on, take off, adjust and wear PPE;
40 The limitations of the PPE;
41 The proper care, maintenance, useful life and disposal of the PPE.

The *Personal Protective Equipment Assessment* should be reviewed during training sessions.

Hearing protection devices are covered in the *Hearing Conservation Section* of this Plan.

32.7 Recordkeeping

32.7.1 General

PPE Assessments, training and electrical protective equipment tests and certifications will be maintained on file.

32.7.2 Records Retention

Record	Maintained By	Retention
PPE Assessment	**Environmental Health and Safety Office**	**Most Current**
Training	**Environmental Health and Safety Office**	**Most Current**
Electrical Equipment Tests/Certifications	**Immediate Supervisor**	**Most Current**

33.1 Introduction

It is essential that all industrial forklift and powered hand truck operators have the knowledge, skill and safety awareness necessary to use the equipment without putting themselves or co-workers in danger.

Proper safe work procedures regarding the operation, loading and inspection of powered industrial trucks are listed in this Section and must be followed by all employees who use either forklifts or powered hand trucks.

Forklift Trucks - Four-wheel trucks with lift controls and a seat for the operator.

Motorized Hand Trucks - The operating controls are in the steering handle and the operator walks behind this type hand truck.

29 CFR 1910.178

33.2 General Requirements - Forklifts and Motorized Hand Trucks

33.2.1 Markings

- Approved powered industrial trucks must bear a label, data plate, or some other identifying mark indicating approval by a testing laboratory for its designated use.

Designations of type of industrial trucks.

D	Diesel
DS	Diesel, with additional safeguards
DY	Diesel, with safeguards, no electrical
E	Electrical
ES	Electrical, with additional safeguards
EE	Electrical, components enclosed
EX	Electrical, can be used in flammable atmospheres
G	Gasoline
GS	Gasoline, with additional safeguards
LP	Liquefied Petroleum Gas
LPS	Liquefied Petroleum Gas, with additional safeguards

- All nameplates, caution signs and instruction markings must be in place and legible.
- The lifting capacity of the forklift must be indicated on the label or date and should be stenciled or marked on the mast.

33.3 Maintenance - Forklifts and Motorized Hand Trucks

33.3.1 General

- Industrial lift trucks must be inspected at least **daily** if they are in use.

Forklift/Motorized Hand Truck Daily Inspection Report

Date_____

Equipment ID_____

Inspected By_____

Check those that are applicable.

1. General

☐ Satisfactory	☐ Unsatisfactory	No oil or water leaks.
☐ Satisfactory	☐ Unsatisfactory	Overhead guard and backrest free of broken, cracked weld-points or other obvious damage.
☐ Satisfactory	☐ Unsatisfactory	Roller tracks are greased and chains free to travel.
☐ Satisfactory	☐ Unsatisfactory	Forks are evenly spaced, free from cracks.
☐ Satisfactory	☐ Unsatisfactory	Hydraulic and other fluid levels adequate.
☐ Satisfactory	☐ Unsatisfactory	Hydraulic lines and fittings - no excessive wear or crimping.
☐ Satisfactory	☐ Unsatisfactory	Lift and tilt cylinders - no damage or leaking fluids.
☐ Satisfactory	☐ Unsatisfactory	Mounting hardware on cylinders is secure. (If LP or LPS)
☐ Satisfactory	☐ Unsatisfactory	Tires are not too worn or split. If pneumatic tires, pressure ok.
☐ Satisfactory	☐ Unsatisfactory	Horn is operational.
☐ Satisfactory	☐ Unsatisfactory	Pedals are operational.
☐ Satisfactory	☐ Unsatisfactory	Parking brake is working properly.

2. Propane Tank

☐ Satisfactory	☐ Unsatisfactory	No cracks, broken weld-points or other damage.
☐ Satisfactory	☐ Unsatisfactory	Valves, nozzles or hoses are secure and not leaking.

3. Battery

☐ Satisfactory	☐ Unsatisfactory	No cracks, or holes in casing.
☐ Satisfactory	☐ Unsatisfactory	Electrolyte levels are correct and cells are sealed.
☐ Satisfactory	☐ Unsatisfactory	No frayed cables or broken insulation.
☐ Satisfactory	☐ Unsatisfactory	Connections are tight.

Deficiencies:_____
_____
_____
_____
_____
_____
_____

Tagged out of service ☐ **YES** ☐ **NO**

Retain 3 Months

- Any powered industrial truck found to be defective, unsafe, or in need of repair, must be *taken out of service* until it is restored to a safe operating condition.

33.3 Maintenance - Forklifts and Motorized Hand Trucks - Continued

33.3.1 General - Continued

- Modifications or additions to a powered industrial truck that will change the capacity or safe operation, may not be done without written approval from the manufacturer. *Update markings or tags accordingly*.

- Only qualified and authorized personnel are allowed to maintain, repair, adjust or inspect industrial trucks.

33.3.2 Changing Propane Cylinders

1) Park the truck in a safe well-ventilated area, away from buildings and other workers.
2) Stop the engine.
3) Wear safety glasses and work gloves.
4) Close the cylinder valve and remove the quick disconnect coupling. (You may need to release any stored gas from the lines)
5) Remove the empty cylinder from the cradle holding device and store in a safe area.
6) Select a filled cylinder and inspect it for damage or leaks.
7) Position the cylinder in the cradle on the truck carefully and ensure that it is positioned properly.
8) Fasten the cylinder hold-down clamp so that the cylinder is locked into position.
9) Reconnect the fuel line to the cylinder liquid service valve and open the valve slowly.
10) Check for leaks. If a leak is found, close the valve **immediately** and notify the supervisor. If no leaks are found, start the engine and proceed with the assigned work.

33.3.3 Battery Change-Out

1) Properly position the truck and apply the brake.
2) Wear safety glasses and work gloves.
3) Remove the battery carefully using proper lifting techniques or a mechanical hoist.
4) Keep all tools or metallic objects away from the top of the battery.
5) Position the battery properly and secure.

Be aware that:

- √ Engine coolant is hot and under pressure; let it cool and removes the cap slowly before checking levels.
- √ When cleaning air filter elements with compressed air, do not exceed 30 psi and wear safety glasses.
- √ Battery electrolyte contains acid and can cause injury, so avoid contact with eyes and skin. *Wear safety glasses and chemical resistant gloves.*

Do not smoke when changing cylinders or batteries or at any other time near an LP or LPS-fueled forklift. Hydrogen gas may be present.

33.4 Safeguards

33.4.1 Forklifts

- Overhead guards are to be installed on ALL high lift rider trucks where overhead lifting is performed, unless operations or conditions do not permit it.
- When carrying a load that presents a hazard of falling back onto the operator, forklifts must be equipped with a vertical load back rest extension.
- No person is to be allowed to stand or pass under the elevated portion of any forklift, whether loaded or empty.

- Arms and legs must not be placed between the uprights of the mast. *Employees should stay within the protective frame of the forklift.*
- No unauthorized riders are allowed on powered industrial trucks.
- Forklifts must be driven slowly and carefully over properly secured dockboards and the rated capacity of the dockboard must not be exceeded.
- A safe distance must be maintained from the edge of ramps, platforms, or any elevated dock.
- Trucks, trailers or railroad cars must have the brakes set and wheels blocked to prevent movement while loading or unloading takes place.
- Check the floor-loading limit before entering an area with a forklift.

33.4.2 Motorized Hand Trucks

- Ensure that hands are not wet or greasy before operating a motorized hand truck. *Work gloves are recommended.*
- Avoid running over loose objects.
- Always give pedestrians the right-of-way.
- Use care not to pinch hands between the truck and other objects.
- Follow the manufacturer's recommended safe work precautions.

33.5 Operation - Forklifts

33.5.1 Steering

- Never drive near the edge of loading docks. A right turn could cause the back of the forklift to swing off the dock.
- When going around corners, always favor the side of the turn.
- When making turns through doorways or narrow openings, move closer to the side of the turn. Get on the right side to turn right and on the left to turn left, this allows for the rear swing.
- When turning sharp corners, keep close to the inside corner.
- When making turns in aisles, keep away from the object to be picked up, allowing room for the forks to swing in without striking the shelves, pallets, etc.
- When turning into an aisle, stay wide.
- When backing out of an aisle, allow enough room for forks to clear before starting the turn.

FORKLIFTS, UNLIKE CARS, PIVOT AROUND THE BACK WHEELS, THEREFORE, EXTREME CAUTION SHOULD BE USED

33.5 Operation - Forklifts

33.5.2 Visibility

- If carrying a large load which blocks forward vision, drive in reverse.

33.5.3 Handling and Moving Loads

Forklifts use the see-saw principle to carry objects. The weight of the load is balanced by the weight of the truck. When the load is too heavy or the center of the load is too far forward, the back

wheels may lift off the ground. Only stable or safely arranged loads are to be handled. ALWAYS use caution when handling off-center loads, which cannot be centered.

- Only lift loads that are within the rated capacity of the industrial truck.
- Ensure that the load is stable and secured.
- If you are unsure of the weight, lift the load a few inches and determine if the wheels are still in firm contact with the floor. If the steering feels normal and the forklift is stable, proceed carefully.

Remember, if objects from a load start to fall, stay inside the forklift!

To Lift the Load:

1) To pick up a load, approach it straight in with forks lowered. Stop about one (1) foot from load.
2) Level the forks and SLOWLY drive forward until the load touches the backrest.
3) Lift the load high enough to clear it.
4) Look behind you to ensure that the area is clear and back out about one (1) foot.
5) Tilt the mast back to stabilize the load.

To Put the Load Down:

1) Drive SLOWLY AND SAFELY to the location.
2) Square up and stop about one (1) foot from the load area.
3) Level the forks and drive in.
4) Lower the load.
5) Tilt the forks slightly forward.
6) Look behind you to ensure area is clear and back straight out.

33.5 Operation - Forklifts

33.5.3 Handling and Moving Loads - Continued

Elevated Loads

1) Remember that removing loads from elevated stacks is the same as lifting a load from a lower position with the additional step of raising the mast after squaring to the load and lowering the mast before backing away with the load.
2) When stacking loads, make sure that you clear the top of the stack before lowering the mast and make sure the load is placed squarely on top.
3) Come to a complete stop at all times before raising the mast.

Driving with a load

1) Travel with a load slightly tilted back. The load should be raised from 4-6 inches at the tips and 2 inches at the heel when traveling.
2) Never turn too quickly with a load or stop too quickly.
3) NEVER SPEED OR MANEUVER EXCESSIVELY.
4) Slow down and sound the horn when entering areas where other employees may be present or when approaching a blind corner or intersection.

5) When ascending or descending grades in excess of ten percent (10%), loaded trucks must drive forward up a ramp and backwards down a ramp.

Parking the Forklift

1) If a forklift is left unattended, lower the forks, turn off the controls, shut off the power, remove the keys and set the brakes.
2) If a forklift is left on an incline, wheels must be blocked.
3) Never block exits or safety equipment with the forklift or loads, even for a short time.

A forklift is unattended if the operator is twenty-five (25) feet or more from the vehicle which remains in his/her view, or whenever the vehicle is not in his/her view.

33.6 The Working Environment

33.6.1 General Safe Work Precautions

- The atmosphere or location where a forklift will be used must be classified according to its hazard level in order to determine the type industrial truck that may be safely used. *Guidelines in Table N-1, 29 CFR 1910.178 must be used as a guideline.*
- Carbon monoxide gas concentrations within work areas must not exceed permissible exposure limits. (PELs)

33.6.1 General Safe Work Precautions - Continued

- Know the work area. Look for potholes, nails, boards or loose materials.
- Never drive over oil spots to avoid slipping or sliding..
- Be aware of obstructions, such as pipes, open doors, I-beams, etc.
- Look for overhead pipes, wires, beams, etc., before elevating a load.
- Make sure that all personnel are clear of the path to be taken.
- Always look behind you before backing up.
- Promptly report any conditions that might make operation of the forklift hazardous.

33.7 Training

33.7.1 Initial Training and Evaluation

Each powered industrial truck operator must be trained and evaluated to ensure that they are competent to operate the vehicle safely. The employer must ensure that each operator has successfully completed a training program consisting of formal instruction, practical training and an evaluation of their performance in the workplace, before they operate a powered industrial truck on the job.

Training Must include:

1) The operating instructions, warnings and precautions for the type of truck the operator will be authorized to use;
2) The differences between the operation of an automobile and a powered industrial truck;
3) The location, purpose and function of the operating controls and instrumentation;
4) Engine or motor operation;
5) Steering and maneuvering;
6) Visibility - including restrictions due to loading;
7) Fork and attachment adaptation - operation and use limitations;
8) Vehicle capacity and stability;
9) Inspection and maintenance requirements;
10) Refueling, recharging and battery change-out procedures
11) Operating limitations;
12) Any other instructions or precautions listed in the manufacturer's operating manual for the type of vehicle the employee is being trained to operate;
13) Surface conditions where the vehicle will be operated;
14) Load compositions and stability;
15) Load manipulation, stacking and unstacking;
16) Safety in pedestrian traffic areas;
17) Operation in restricted places or narrow aisles;
18) Hazardous locations and their classifications;
19) Operation on ramps or other sloped surfaces;
20) Closed environments and other areas where insufficient ventilation could cause a concentration of carbon monoxide exhaust in excess of permissible exposure limits (PELs);
21) Any other environmental hazards that could affect safe operation.

33.7.2 Refresher Training and Evaluation

An evaluation of each powered industrial truck operator's performance is conducted at least every three years and refresher training, including an evaluation of the effectiveness of training must be conducted if:

- √ The operator has been observed operating the vehicle unsafely;
- √ The operator has been involved in an accident or near miss with the vehicle;
- √ The operator's evaluation indicates a deficiency in training;
- √ The operator is assigned to a different type truck;
- √ There is a change in workplace conditions that could affect safe operation.

33.8 Recordkeeping

33.8.1 General

- A written certification of the training and evaluation must be maintained and include the following:
- √ The name of the operator;
- √ The date of the training and the date of the evaluation;
- √ The identity of the person performing the training or evaluation;

√ A course agenda.

33.8.2 Retention

Record	Maintained By	Retention
Forklift Inspections	**Supervisor**	**3 months**
Training	**Environmental Health and Safety Office**	**Most Current**

Section 34: Recordkeeping

34.1 Introduction

Procedures must be established for maintaining all records as required to meet government and internal requirements. Records required by the State of Florida or the Occupational Safety and Health Administration and other government agencies will be made available for inspection upon request.

Statutes and Regulations Cited With Each Form

34.2 Forms

Form: **LES SAF Log and Summary of Occupational Injuries, Diseases and Illnesses**

***Purpose*:** Use this form to maintain a record of recordable occupational deaths, injuries and illnesses as required by the *F.A.C. Rule 38I-60*.

Prepared: Entries are to be made within six days of occurrence of illness or injury; an annual summary of all totals is to be completed and certified by March 1st of each year.

***Retention*:** 3 years plus current

Report fatalities or more than three (3) hospitalizations orally and in writing to the U.S. OSHA Director within eight (8) hours. (OSHA, Tampa, FL 813-626-1177)

Form: **Notice of Injury**

***Purpose*:** Required by State of Florida when any on-duty employee sustains an occupational injury or reports an occupational illness.

Prepared: Within seven days of injury or illness.

***Retention*:** 5 years plus current

If submitted to insurance carrier instead of directly to State agency, send in early enough to comply within a seven day period.

Form: **Accident/Incident Investigation Report (Including Safety Committee Recommendations)**

Purpose**:** Complete if an employee is injured and requires more than first aid or if the employee may have an injury that could become more than first aid at a later date, or if there is an accident or injury involving damage to equipment or material.

Prepared: As soon as possible after occurrence

Retention**:** 3 years plus current

34.3 Written Programs

The following written programs are required and will be available upon request to authorized representatives of the local, state and federal government for review. All programs are to be accessible to School Board of Brevard County employees and available upon request. Many of these programs are contained in this Safety and Health Plan and if so, are indicated by an *****.

- Asbestos Employee Exposure Reduction Plan (29 CFR 1910.1001)*
  - Required if any employees are exposed to airborne concentrations of asbestos at or above the action level.
- Cadmium Compliance Program (29 CFR 1910.1027)
  - Required if any employees have potential exposure to airborne cadmium that exceeds the Permissible Exposure Limit (PEL).
- Chemical Hygiene Plan (29 CFR 1910.1450)*
  - Required if any employees have occupational exposure to chemicals in a laboratory.
- Emergency Evacuation and Fire Prevention Plan (29 CFR 1910.38)*
  - Required if any employees are to be evacuated in the event of an emergency or if employees are exposed to fire hazards in the workplace.
- Equipment Grounding Program (29 CFR 1926.404)*
  - Required on a construction site if Ground Fault Circuit Interrupters (GFCIs) are not used.
- Exposure Control Plan (29 CFR 1910.1030)*
  - Required if any employees have the potential to be occupationally exposed to blood or other potentially infectious bodily fluids during the performance of their job.
- Fall Protection Plan (29 CFR 1926.402)*
  - Required if any employees do leading edge work or if a safety monitoring system is used because it is infeasible or creates a greater hazard to use conventional fall protection.
- Hazard Communication Program(29 CFR 1910.1200)*
  - Required if any employees have potential to be exposed to hazardous chemicals.
- Lockout/Tagout Program (29 CFR 1910.147)*
  - Required if employees could be exposed to unexpected energization or startup of equipment during maintenance or repair.
- Permit-Required Confined Space Entry (29 CFR 1910.146)*

  - Required if any employees must enter permit-required confined spaces.
- Respiratory Program (29 CFR 1910.134)*
  - Required if any employees must wear respirators.

All written programs are to be periodically evaluated as required and revised as necessary. Responsibilities for this requirement are indicated in the appropriate related Section of this Plan.

34.4 Miscellaneous Records

The following records are representative of the type records that must be maintained on file and available for inspection, upon request, by authorized representatives of the local, state and federal government. See the applicable Section of this Plan for the retention times and additional information.

1) Biohazardous Waste Manifests
2) Confined Space Assessment
3) Cranes: Maintenance and Service Logs
4) Designs and Drawings for Excavations
5) Electrical PPE, Equipment Test/Certifications
6) Emergency/Fire Drills
7) Exposure and Industrial Hygiene Monitoring Records
8) Fire, Casualty and Sanitation Annual Inspection Reports
9) Hazard Assessments
10) Hazardous Waste Manifests
11) Hazardous Waste Sample Test Results (Characterizations)
12) Site Inspections
13) Job Hazard Analyses
14) Lockout/Tagout Observations
15) Lockout/Tagout Procedure Forms
16) Lockout/Tagout Surveys
17) Medical Records (Physicals, Exposures, Vaccination Records, Audiometric Testing, etc.)
18) Permits
19) Personal Protective Equipment (PPE) Assessments
20) Playground Inspection Reports (Initial, Daily, etc.)
21) Safety Audits
22) Safety Committee Meeting Minutes and Correspondence
23) Sterilizer Tests
24) Sound Surveys
25) Training Records
26) Workplace Violence Incident Reports

34.5 Posting

37.2.3 Federal

Emergency Phone Numbers (OSHA)
Equal Employment Opportunity (42 U.S.C. 200e-10)
Federal Minimum Wage (29 CFR 516.4)
Underage Workers (Fair Labor Standards Act)
Family and Medical Leave Act of 1993 (29 CFR 825.300)

Employee Polygraph Protection Act (29 CFR 801.6)
Job Safety and Health Protection - #2203 (29 CFR 1903.2) (OSHA)

37.2.4 State

Florida Law Prohibits Discrimination (29 CFR 760.10)
Unemployment Compensation (Florida Statute 443.151)
Workers' Comp Works for You (Florida Statute 440.40)

Section 35: Respiratory Protection

35.1 Introduction

In order to protect employees exposed to hazardous dusts, fumes, vapors and mists that are generated by certain facilities and vehicle maintenance and support operations, the School Board of Brevard County has established the following Respiratory Protection Program. This Program has been developed in compliance with the Occupational Safety and Health Administration's (OSHA) Respiratory Protection standard. Respirators must be worn in areas where acceptable exposure limits cannot be achieved through engineering or other controls.

29 CFR 1910.134

35.2 Responsibilities

35.2.1 The School Board of Brevard County Must:

- Provide the correct respiratory protection when necessary to protect the health of School Board of Brevard County employees where their exposure exceeds the OSHA Permissible Exposure Limit (PEL) over an 8-hour Time Weighted Average (TWA_8), the Ceiling Limit (C), or the Short Term Exposure Limit (STEL).
- Ensure that employees who are required to wear respirators are medically evaluated before use, and **annually** thereafter.
- Provide all respiratory protection, training and medical evaluations or examinations at no cost to the employee.
- Provide a written respiratory protection program for respirator use.
- Provide required training to School Board of Brevard County employees.
- Ensure that a qualified program administrator is assigned responsibilities for administration of the program.

35.2.2 Respiratory Protection Program Administrator

- Evaluates tasks to determine the degree of hazard posed by potential exposure and specifies what type of respiratory protection is to be used for each task.
- Oversees the program to ensure compliance.
- Evaluates the program for effectiveness.
- Is trained in all components of applicable respiratory protection.

- Updates the program as required.
- Is responsible for the administration of the program.

The School Board of Brevard County's Industrial Hygienist will be assigned the responsibilities of the Respiratory Protection Program Administrator.

35.2.3 Principals and Facility Managers, or their Designees Must:

- Provide the names of all persons under their supervision who are required to wear respiratory protection to the Industrial Hygienist and establish a record for each as shown in the Recordkeeping Section of this Program.
- Immediately notify the Industrial Hygienist when a new hire who may be subject to the program requirements, enters the work force.
- Ensure that employees are using respiratory protection as required by this program.
- Maintain a list of persons trained and medically qualified to wear respiratory protection in each department.
- Ensure that a list of approved respirators and a change-out schedule, or procedures for each, is included in the Site Specific Section.
- Ensure that respirators and accessories are readily available.
- Provide storage areas and encourage proper maintenance.
- Immediately notify the Industrial Hygienist when contracted employees may be subject to the program requirements.
- Re-direct employees whose job requires them to wear a respirator, but who cannot wear a respirator safely.

35.2.4 Employees Must:

- Participate in training.
- Ensure that their respirators fit properly.
- Use respiratory protection when required.
- Report dangerous conditions or symptoms of exposure.
- Notify their supervisor of any physical or other changes that may affect their ability to properly use respiratory protection.
- Inspect respirator(s) before each use per the procedures shown in this program.
- Immediately report any malfunctions of the respirator to supervision.
- Clean, disinfect and store their respirator(s) in a clean, sanitary location.

35.3 Written Program Requirements

35.3.1 General

Per OSHA 29 CFR 1910.134, this program contains the following:

√ Assignment of a Respiratory Protection Program Administrator;

- √ A hazard evaluation procedure;
- √ Written standard operating procedures for the selection and use of respirators;
- √ Fit testing requirements for tight-fitting respirators;
- √ Training and information requirements;
- √ Cleaning and disinfecting procedures;
- √ Respirator storage requirements;
- √ Respirator inspection procedures;
- √ A process to ensure adequate air quality and flow for atmospheric-supplying respirators;
- √ A requirement to ensure surveillance of employees using respirators for exposure or stress;
- √ A program evaluation process;
- √ Requirements for medical evaluations for respirator users;
- √ An approved respirator list and change-out schedule.

35.4 Hazard Evaluation

35.4.1 General

Respirators are to be selected only after exposures, or potential exposures to harmful concentrations of contaminants in the workplace atmosphere have been determined. ***Hazardous airborne contaminants that employees may inhale are to be identified and the amount of employee exposure estimated.***

37.2.3 Evaluation of Hazardous Exposures

Will be determined by:

1) Personal air monitoring, air sampling and analysis;
2) Use of objective data from industry studies, trade associations or chemical manufacturers;
3) Using specific chemical properties along with the environmental dimensions or other pertinent data to estimate maximum anticipated exposure.
4)

The Industrial Hygienist will work with supervisory personnel to identify locations where air sampling and analysis are needed.

- Determinations are made prior to the beginning of any routine or non-routine task and if changes in equipment, processes, products or control measures could result in new exposures.
- Hazard evaluations are documented and records maintained on file.

35.4 Hazard Evaluation - Continued

35.4.2 Evaluation of Hazardous Exposures - Continued

Examples of Hazards to be Evaluated:

1) Dusts, mists, fumes, vapors and gases, which if inhaled can cause illness or death, that may be generated from activities such as:
   - Welding and cutting lead-based metals or those that may contain cadmium, beryllium, etc.;

- Spray-painting and spray booth operations;
- General chemical use;
- Use of pesticides, herbicides or fungicides;
- Exposure to biohazardous contaminants;
- Sandblasting and grinding operations;
- Asbestos brake work;
- Asbestos abatement;
- Cleaning and disinfecting procedures;
- Chemical spill response.

2) Oxygen deficiency
   - Work in confined spaces using flames, toxins, or air-displacing chemicals;
   - Work in areas where oxygen-displacement could occur.

A Hazard assessment is included in the Site Specific Section of this Plan.

35.5 Selecting Respirators

35.5.1 Selection

Respirator selection is made on the basis of the known or anticipated task(s) and the health hazard(s) associated with those tasks. **(See the Material Safety Data Sheet (MSDS) or contact the manufacturer for assistance in determining the specific hazards of each chemical exposure.)**

Consider the following when selecting the proper respirator for the job:

1) The type of contaminant and severity of the respiratory hazard;
2) The contaminant's physical characteristics, chemical composition, toxicological information and odor threshold data;
3) The Threshold Limit Values (TLVs) or Permissible Exposure Limits (PELs);
4) Immediately Dangerous to Life or Health (IDLH) concentrations;
5) The possibility of eye irritation;
6) The location of the hazardous area;
7) The period of time the respirator is to be worn;
8) The activities of the workers or general use conditions;
9) The capabilities and limitations of the respirator;
10) The respirator's Assigned Protection Factor (APF).

35.5.2 Types of Respirators

a) ***Air-purifying (filtering)***

- Used when the air has enough oxygen but contains hazardous contaminants.
- These respirators filter out the hazardous materials or purify the air by mechanical (filter) or chemical methods.

- Some air-purifying respirators have replaceable filters, canisters or cartridges designed to remove specific contaminants.
- Cartridges and canisters are color-coded to make selection easier.

b) ***Atmosphere-supplying***

- Used when the air does not have enough oxygen, or in situations identified as "**Immediately Dangerous to Life or Health" (IDLH).**
- Used when the contaminant has poor warning properties. (Cannot be detected by human senses at safe concentrations or the senses become adapted to it.) *(e.g.; Isocyanates, Carbon Monoxide, Mercury Vapor)*
- Used when the contaminant exceeds the acceptable limitations of the air-purifying respirator (APR).
- Breathing air is provided through either a tank or compressor.

Limitations of Atmosphere-supplying Respirators

- **Self-contained Breathing Apparatus (SCBA)** respirators are portable and allow you to move around, but the amount of air is limited.

- **Supplied-air respirators** (SARs) have masks, which are connected by a hose to an air compressor or large tank of compressed air. They provide unlimited air, but the hoses restrict movement.

35.5.3 Selection Criteria

Only respirators certified by the National Institute for Occupational Safety and Health (NIOSH) may be used!

- **Use either of the following in Immediately Dangerous to Life or Health (IDLH) atmosphere. *(Includes all oxygen-deficient atmospheres, <19.5% oxygen)***

  - Full facepiece pressure demand self-contained breathing apparatus (SCBA) (Minimum service life = 30 minutes);
  - Combination full facepiece pressure demand supplied-air respirator (SAR) with an auxiliary self-contained air supply (5-minute escape cylinder).

35.5.3 Selection Criteria - Continued

- **Gases and Vapors (Non-IDLH) - May use any of the following:**

  - Atmosphere-supplying respirator (SCBA, SAR);
  - Air-purifying respirator, if
    - It is equipped with an end-of-service-life indicator (ESLI); or

√ The change-out schedule shown in this program is followed.

- **Particulates - May use any of the following:**

  - ð Atmosphere-supplying respirator (SCBA, SAR);
  - ð Air-purifying respirator equipped with high efficiency particulate air (HEPA) filters;
  - ð Air-purifying respirator equipped with any filter certified for particulates by NIOSH for contaminants with particles of at least 2 micrometers;
  - ð A NIOSH 42 CFR 84 approved particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

42 CFR 84 Product Classifications Key (Particulate Respirators)

Resistance:	***Efficiency:***
N - Not to be used for oil	**95** - At least 95% efficient
P - Oil Proof	**99** - At least 99% efficient
R - Oil Resistant	**100** - At least 99.7% efficient

Special Considerations

- Respiratory protection for tuberculosis (TB) must be either an air-purifying respirator with HEPA filters or any of the 42 CFR 84 particulate filter respirators as shown in the table above.

35.6 Respirator Use

35.6.1 General

- Respirator users must be trained and instructed in the proper use of respirators and their limitations.
- Only respirators identified in the Site Assessment may be used.
- Only clean, sanitary respirators may be worn.
- Respirators must never be removed in a potentially hazardous atmosphere.
- If there is a respirator malfunction or an indication of breakthrough, the employee must leave the respirator-use area to make corrections or replace the cartridge or filter. NEVER reenter the area until the respirator is replaced or repaired.
- A defective respirator must never be used, but tagged "**OUT OF SERVICE**" until repaired.

35.6.2 Procedures for Respirator Use in Immediately Dangerous to Life or Health (IDLH) Atmospheres

- An SCBA or an SAR with a five-minute escape-only cylinder must be used.
- Preparations must be made for emergency rescue or response to respirator failure.
- One person must be on standby outside the IDLH atmosphere and in communication with the person inside at all times.

- The standby must be trained and equipped to provide rescue.
- There must be a specific "Emergency Procedure" for rescue established that includes:
  - √ Notification procedures if the standby must enter the area for emergency rescue;
  - √ What actions or assistance will be provided.

The need for multiple standbys should be evaluated based on the ability to perform all required duties, such as monitoring, or rescue.

35.6.3 Proper Fit

Proper fitting instruction will be presented at the **Training Session** using the type respirator the employee will use and must include:

- Demonstrations and practice in how to wear;
- How to adjust;
- How to determine if it fits properly;
- How to check for a tight seal using negative and positive pressure fit check.

A negative and positive pressure fit check must be performed before each use.

NEVER WEAR a respirator when any condition prevents a good seal.

A Respirator cannot be worn safely if the employee:

- Wears glasses with temple pieces;
- Has a beard, mustache, or long sideburns;
- Has breathing problems such as asthma;
- Has a heart condition;
- Has claustrophobia;
- Is heat sensitive, or;
- Has facial deformities.

35.6.4 Change-out Procedures

Cartridges or filters must be changed:

- If the end-of-service-life indicator (ESLI) is activated;
- If the change-out schedule indicates a need to do so;
- If a need is otherwise indicated.

A Site Specific change-out schedule is included in this program.

35.7 Breathing Air Quality and Use

35.7.1 General

- Must meet requirements for Grade D breathing air per ANSI/CGA Commodity Specification for Air, G-7.1-1989.

- Grade D breathing air is composed of Oxygen 19.5-23.5%; hydrocarbon 5mg/m^3 of air or less; carbon monoxide of 10 ppm or less; carbon dioxide of 1,000 ppm or less; with a lack of noticeable odor.

35.7.2 Air Compressors

- If a compressor is used to supply breathing air it should be located so that the intake is in an area uncontaminated by exhaust gases.
- A tag containing the signature of the person authorized by the employer to change the in-line filtering systems and the date of the latest change must be attached to the compressor.
- A compressor that is **NOT oil-lubricated** must have a method of ensuring that carbon monoxide (CO) levels do not exceed 10 ppm such as:
  - √ Placing the air intake in an area free from contaminants;
  - √ Frequent or continuous monitoring of the breathing air supply;
  - √ Using carbon monoxide (CO) filters, or;
  - √ Installing a high temperature alarm or shutoff device.
- A compressor that **IS oil-lubricated** must have;
  - √ A carbon monoxide (CO) alarm; or
  - √ A high temperature alarm;
  - √ or both.

If the high temperature alarm is used without the CO monitor, the breathing air must be tested for the presence of CO at intervals sufficient to ensure that CO levels do not exceed 10 ppm.

35.7.3 Cylinders

- Cylinders, if used, must be tested and maintained as prescribed in the *Department of Transportation Regulations (49 CFR part 173 and part 178).*
- Cylinders of breathing air must have a certificate of analysis (COA) from the supplier that certifies that the requirements for Grade D air and moisture content are met. (*COAs must be maintained on file for review.)*
- If compressed or liquid oxygen is used, it must meet the specifications for breathing oxygen outlined by the United States Pharmacopoeia (USP).
- Compressed oxygen must not be used for any atmosphere-supplying respirators that previously used compressed air.
- Only equipment designed for oxygen service or distribution may be used where oxygen concentrations exceed 23.5%.
- All breathing air couplings must be incompatible with those of non-respirable air or other gases used at the site and no asphyxiating substance may be introduced at any time into breathing airlines.

35.8 Fit Testing

35.8.1 General

A qualitative or quantitative fit test must be performed for all employees using negative or positive tight-fitting respirators. *Fit testing is not required for those using escape-only respirators or for employees who are not required to wear a respirator, but do so voluntarily for their own comfort.*

- Fit testing must be performed before a respirator is used.
- Fit testing must be conducted if a different respirator facepiece is used, if the employee's physical characteristics change, thus affecting the seal and at least **annually.**
- Fit testing procedures in *OSHA 29 CFR 1910.134, Appendix A* must be followed.
- Fit testing documentation must be kept on file.

35.8 Fit Testing - Continued

35.8.2 Qualitative Fit Tests (QLFT)

- Use to fit negative pressure air-purifying respirators that must achieve a fit factor of 100 or less and where atmospheric exposure is less than 10 times the PEL.

Examples:

- *Irritant Smoke (Stannic Chloride) Test* - use with HEPA or P100 series filter(s).
- *Isoamyl Acetate Test* - must be used with organic vapor cartridge (not suitable for particulate respirators).
- *Saccharin Solution Aerosol Test* - use particulate filter(s).
- *Bitrex ä Solution Aerosol Test* - use particulate filter(s).

- The employer must ensure that the person(s) administering a QLFT can prepare test solutions, calibrate equipment, recognize invalid tests, ensure test equipment is in proper working order and perform tests properly.
- The employer must also ensure that the QLFT equipment is kept clean and well maintained.

35.8.3 Quantitative Fit Tests (QNFT)

- This type test utilizes a test chamber and a sampling line and is required to test respirators when atmospheric exposure will exceed 10 times the PEL.
  - √ A minimum fit factor of 100 is required for all quarter and half-mask respirators.
  - √ A minimum fit factor of 500 is required for all full facepiece respirators.

Examples:

- Generated Aerosol (corn oil, salt, DEHP)
- Condensation Nuclei Counter (PortaCount™)
- Controlled Negative Pressure (Dynatech FitTester 3000™)

- The employer must ensure that the persons administering a QNFT can calibrate equipment, recognize invalid tests, ensure test equipment is in proper working order, calculate fit factors and perform tests properly.
- The employer must also ensure that the QNFT equipment is kept clean and maintained and calibrated according to the manufacturer's instructions.

35.8.4 Table 1 - Acceptable Fit Testing Methods

Use the following table to determine appropriate fit testing methods:

Table 1 Acceptable Fit Testing Methods		
	QLFT	**QNFT**
Half-face, Negative Pressure, APR (<100 fit factor)	**Yes**	**Yes**
Full-face, Negative Pressure, APR (<100 fit factor) used in atmosphere up to 10 times the PEL	**Yes**	**Yes**
Full-face, Negative Pressure, APR (>100 fit factor)	**No**	**Yes**
Powered Air-purifying Respirator (PAPR)	**Yes**	**Yes**
Supplied-air Respirators (SAR), or SCBA used in Negative Pressure (Demand Mode) (>100 fit factor)	**No**	**Yes**
Supplied-Air Respirators (SAR), or SCBA used in Positive Pressure (Pressure Demand Mode)	**Yes**	**Yes**
SCBA/SAR - IDLH, Positive Pressure	**Yes**	**Yes**
Mouthbit Respirators	**Fit testing not required**	
Loose-fitting Respirators (e.g., hood helmets)		

35.9 Respirator Care

35.9.1 Inspection Procedures

- Inspect, using the following procedures, before and after each use and **at least monthly:**
  1) ***Air-purifying respirators:***
     - ð **Inspect facepiece for:**
       - Excessive dirt;
       - Cracks, tears, holes, distortion, or inflexibility;
       - Cracked, scratched lenses in full facepieces.
     - ð **Inspect headstraps for:**
       - Breaks, tears, or loss of elasticity;
       - Broken buckles or attachments.
     - ð **Inspect valves for:**
       - Cracks, tears, or dirt;
       - Missing valve covers.
     - ð **Inspect filter, canister or cartridge to ensure that it is**:
       - The proper one for the anticipated hazard;
       - Correctly installed;
       - Not expired (out-of-date).

35.9 Respirator Care - Continued

35.9.1 Inspection Procedures - Continued

2) ***Supplied-air Respirators (SARs) and Self-contained Breathing Apparatus (SCBAs):***

- **Inspect respirator facepiece and hood for:**
  - Cracks, tears, dirt, or other damage.
- **Inspect headstraps for:**
  - Breaks, tears, or loss of elasticity.
- **Inspect valves for:**
  - Cracks, tears, or dirt.
- **Inspect air supply lines and hoses to ensure:**
  - Hose integrity, good condition, tightness of connections, and incompatibility with other gases.
- **Inspect regulators, valves and air-flow regulators to ensure that they are:**
  - The correct type and in good operating condition.
- **Inspect cylinders to ensure that they:**
  - Are adequately charged and contain approved breathing air.

If repairs are necessary, they should be made as soon as possible. If parts are not available, tag the respirator "DO NOT USE" until repairs are made by a qualified person. Request a new respirator if a job with hazardous exposures must be completed. NEVER USE A DEFECTIVE RESPIRATOR.

35.9.2 Cleaning and Disinfecting

- Respirators must be regularly cleaned and disinfected. Those used by more than one employee must be thoroughly cleaned and disinfected *after each use*.

Procedure:

1) Remove the respirator carefully to avoid contamination.
2) Remove cartridges, filters or canisters. Disassemble completely.
3) Discard or repair any defective parts.
4) Immerse the rubber assembly and other components in a mild cleaning, disinfecting solution. If the cleaning agent does not contain a disinfectant, soak in one of the following solutions for at least two minutes:
   - 1 milliliter bleach to 1 liter of water, or
   - 0.8 milliliters of iodine to one liter of water, or
   - an equivalent disinfectant.
5) Wash with a stiff bristle brush.
6) Rinse thoroughly in clean, warm running water.
7) Drain, hand-dry with a clean, lint-free cloth, or air dry.
8) Reassemble the facepiece and replace filters, cartridges, or canisters if necessary.
9) Test the respirator to ensure proper working condition.

35.9 Respirator Care - Continued

35.9.3 Storage

- Place respirators in self-locking plastic bags or plastic containers and store in an area where the respirator is protected against dust, sunlight, heat, cold, moisture and chemicals.

DO NOT STORE RESPIRATORS IN LOCKERS AND TOOL BOXES UNLESS THEY ARE PROTECTED FROM CONTAMINATION, DISTORTION AND DAMAGE.

Emergency-use and rescue respirators must be quickly accessible at all times and the storage area or container clearly identified.

35.10 Training

35.10.1 General

- Training must be provided prior to the use of a respirator and must be comprehensive and understandable.
- Retraining is required **annually** and more often if a need is indicated, such as:
  - √ A change in workplace conditions;
  - √ When new types of respirators are used;
  - √ If inadequacies in the employee's knowledge or use indicates a need.

The basic advisory information in Appendix D must be provided to employees who wear respirators when such use is not required by the standard or the employer.

Training for employees who will use respirators and their supervisors must include:

1) A review of the *Respiratory Protection Standard (29 CFR 1910.134)* and this Program;
2) The nature and extent of the inhalation hazards of airborne contaminants;
3) Instruction and training in the proper use of respirators and their *limitations;*
4) How to use respirators in emergency situations;
5) How to select the appropriate respirator;
6) How to maintain and properly store respirators;
7) How to ensure the proper fit of respirators with instruction in applying positive and negative pressure fit checks;
8) How to inspect respirators;
9) How to recognize medical signs and symptoms that may limit or prevent respirator use.

Supervisors will receive the following additional training:

10) Implementation procedures for the Respiratory Protection Program;
11) The nature and extent of employee exposure to respiratory hazards;
12) Disciplinary practices related to violations of respiratory protection policies.

35.10.1 General - Continued

- A training record with the employee name, identification number, date of training, name of instructor and a sample agenda will be maintained on file for a minimum of five years.

35.11 Medical Evaluation

35.11.1 General

- Employees will not be assigned to tasks requiring the use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. This evaluation will be completed by a physician or other licensed health care professional (PLHCP).
- The following are a few of the many conditions that could influence an employee's ability to perform work while wearing a respirator:
  - Breathing problems
  - Heart Problems
  - Claustrophobia
  - Severe or progressive hypertension
  - Epilepsy, grand mal or petit mal
  - Anemia
  - Diabetes
  - A punctured eardrum

35.11.2 Medical Evaluation Procedures

- A "confidential" medical evaluation of the employee's ability to use a respirator will be completed **prior to fit testing and use.**
- A medical evaluation may consist of either:
  1) Completion of the mandatory medical questionnaire found in *Appendix C of OSHA 29 CFR 1910.134*, (A sample can be found in the *Forms Section*) or;
  2) A physical examination that elicits the same information.
- The PLHCP will send the employer a written recommendation regarding the employee's ability to use the respirator after the medical evaluation is complete.
- The employee must be given an opportunity to discuss the results of the medical evaluation with the PLHCP.

35.11.3 Follow-up medical examinations are required if:

- A positive response is given to any question among questions 1 through 8 in Section 2, Part A of the medical questionnaire; or;
- A need is identified in the initial medical examination and recommended by the PLHCP.

35.11.4 Administration of the medical questionnaire or examination

If the medical questionnaire is used:

- The medical questionnaire may be distributed to the employee for completion. If so, an addressed, postage-paid envelope must be provided so that the completed form can be mailed DIRECTLY to the designated PLHCP. *The employer must not review the completed form.*
- The medical questionnaire may be provided by the PLHCP directly to the employee.

- The questionnaire must be administered so employees can understand the content.

- The employee must be informed of the confidentiality and availability of the medical questionnaire as indicated in *OSHA's 29 CFR 1910.1020* standard, or in the *Medical and Exposure Records Section* of this Safety Plan.

If a medical examination is used:

- Exams will be administered during normal working hours or at a time and place convenient to the employee.
- Results of the examination will be maintained by the occupational medical facility or Personnel Department for 30 years after the employee's termination date in accordance with *OSHA 29 CFR 1910.1020.*

Employees who refuse to be medically evaluated cannot be assigned to work in areas where they are required to wear a respirator.

35.11.5 Supplemental Information to be provided to the PLHCP:

- √ The type and weight of respirator to be used by the employee;
- √ The duration and frequency of respirator use;
- √ Expected physical work effort;
- √ Additional protective clothing and equipment to be worn;
- √ Temperature and humidity extremes that may be encountered;
- √ A copy of this Respiratory Protection Program;
- √ A copy of *OSHA's Respiratory Protection Standard (29 CFR 1910.134).*

35.11.6 Reevaluations or additional Medical Evaluations may be required if:

- An employee reports medical signs or symptoms that are related to the ability to use a respirator.
- A PLHCP, supervisor, or program administrator informs the employer that an employee needs to be reevaluated.
- Information from the respiratory protection program, including observations made during fit testing and program evaluations, indicates a need for employee reevaluation.
- A change occurs in workplace conditions, such as the physical work effort, protective clothing, or temperature that may result in a substantial increase in the physiological burden placed on an employee.

35.11.7 Surveillance for Exposure or Stress

Work area conditions and employee exposures to hazards and stress are kept under surveillance when work requiring respiratory protection is in progress. Appropriate actions are taken to ensure employee safety if deficiencies are noted.

35.12 Program Evaluation

Random inspections to ensure compliance with this program must be conducted on an ongoing basis by Directors and Supervisors. A program evaluation will be conducted **at least quarterly** by the Respirator Program Administrator to ensure that respirators are properly selected, used, cleaned and maintained. The *Respirator Program Evaluation Form* (See the *Forms Section* of this Plan) may be used and if so, will be completed and kept on file.

Respirator Program Evaluation Form

Date_____ Observer_____ Employee Observed_____

Job Requiring Use of Respirator_____

‰ Air-purifying ‰ SCBA ‰ SAR

‰ YES ‰ NO Proper respirator selected (and cartridge/filter, if applicable)
‰ YES ‰ NO Inspected prior to use
‰ YES ‰ NO Respirator properly donned
‰ YES ‰ NO Performed negative and positive pressure fit checks
‰ YES ‰ NO Used for duration of exposure
‰ YES ‰ NO Cleaned and stored properly after use
‰ YES ‰ NO Training is current
‰ YES ‰ NO Medically qualified to use
‰ YES ‰ NO Fit tested for respirator used
‰ YES ‰ NO Fit testing current

Additional: Atmosphere-supplying respirators (SCBA, SAR) only:
‰ YES ‰ NO Breathing air meets requirements for CGA G7.1 for Type I, Class D breathing air.
‰ YES ‰ NO All equipment meets the requirements of *29 CFR 1910.134, OSHA Respiratory Protection Standard*.

Deficiencies Noted
_____
_____
_____

Corrective Action(s) Recommended:
_____
_____
_____
_____
_____
_____

Date Corrective Actions Completed:_____**Results reviewed with Observed Personnel ‰ YES ‰ NO**

Use one form for each employee observed.

RETAIN 1 YEAR

35.13 Recordkeeping

35.13.1 Access to Records

- Written materials must be made available for inspection and/or copying to affected employees, their designated representatives, the State of Florida, or the Occupational Safety and Health Administration (OSHA), upon request.

35.13.2 Employee Records

- A record for each employee who wears a respirator must be established and include:
  - √ Name
  - √ Job Title
  - √ Social Security Number
  - √ Date of employment
  - √ Date of termination
  - √ Fit test date(s)
  - √ Training date(s)

35.13.3 Inspection Records

- A record (tag or written form) of monthly inspections for emergency use respirators must be maintained and include the following information:
  - √ The date the inspection was performed;
  - √ The name (or signature) of the person performing the inspection;
  - √ The findings;
  - √ Any required remedial action(s); and
  - √ A serial number or means of identifying the respirator.

35.13.4 Retention of Records

Record	Maintained By	Retention
Medical Evaluations	**Personnel Office/Occupational Medical Facility**	**30 years after termination date**
Exposure Monitoring Records	**Environmental Health & Safety Office**	**30 years**
Certificate of Analyses (COAs) for Breathing Air	**Industrial Hygienist**	**5 years**
Training Documentation	**Environmental Health and Safety Office**	**5 years**
Fit Tests	**Industrial Hygienist**	**Retain most current**
Monthly Inspections	**Supervisor**	**12 months**
Respirator Program Evaluation Forms	**Environmental Health & Safety Office**	**1 year**

Section 36: Safety Committees

36.1 Introduction

Both the Executive Safety Committee (ESC) and the Site Safety Committees (SSC) are an essential part of the School Board of Brevard County's Safety and Health Program. These committees provide an approachable body for employee safety and health complaints and suggestions as well as providing assistance in the development and introduction of new safety rules, preventative practices and safe work procedures.

36.2 Responsibilities

36.2.1 The Principal or Facility Manager Should:

- Determine the total number of members that will serve on the Site Safety Committee.
- Select committee members in accordance with Sections 36.3.1 and 36.4.1.
- Determine the length of tenure for all members of the Site Safety Committee.
- Schedule the first meeting not more than forty-five days after the initial Site Safety Committee's inception date.
- Ensure that written minutes of each meeting are kept and that the date, names of attendees and business discussed are included.
- Ensure that employees are informed of the location and availability of the meeting minutes.
- Compensate committee members their regular hourly wage while they are engaged in workplace safety committee training, meetings, or other pertinent duties.

36.2.2 Executive Safety Committees Must:

- Fulfill all functions and duties as shown in Section 36.3.2.

36.2.3 Site Safety Committees Must:

- Fulfill all functions and duties as shown in Section 36.4.2.

36.3 Executive Safety Committee (ESC)

36.3.1 Membership Requirements

- The ESC will be co-chaired by the Assistant Superintendent of Facilities Services and the Director of Public Safety and include the following representatives:
  - Director of Risk Management
  - Director of Transportation
  - Director of Maintenance
  - District Communications / PIO
  - Area Superintendent
  - Director of Food Services
  - Environmental Services
  - Medical
  - Weapons on Campus Group - 4
  - Safe and Drug Free School Project Manager
  - Safety Coordinator

- Exceptional Education Representative
- Secondary School Principals - 2
- Primary School Principals - 2
- BFT Representative
- 1010 Representative

36.3.2 ESC Duties and Functions

- The ESC is responsible for overseeing all of the School Board of Brevard County 's safety activities.
- The ESC will:
  - Evaluate the Site Safety Committees' activities;
  - Approve implementation of training programs; and
  - Provide reports to the Superintendent regarding the status of the District's safety and health.
- The ESC will review specific accident causes and provide guidance to worksite management concerning safety program compliance.

36.3.3 ESC Meetings

- Meetings will be held at least quarterly; and
- When called upon by the chair to review mishap trends, safety inspection activities, Site Safety Committee reports and to resolve problems beyond the control of the SSCs.

36.4 Site Safety Committees (SSCs)

36.4.1 Membership Requirements

- The committee membership is to be made up of both employee and administrative/supervisory representatives who are volunteers or who have been selected by their co-workers. *If sufficient representation is not obtained by this means, the site administrator will appoint personnel.*
- A minimum of six persons will be selected with a designated administrator/supervisor chairing the committee.
- The number of employee representatives should be equal to, or greater than administrative/supervisory representatives.

36.4.2 SSC Duties and Functions

- The SSC will operate solely for the purpose of reviewing hazards, mishaps/accidents and other tasks associated with the workplace safety program.
- The SSC will:
  - Establish, communicate and conduct internal safety inspections;
  - Support the "School Condition Assessments";
  - Assist in conducting emergency drills and fire/safety inspections;
  - Communicate procedures for investigating workplace accidents, safety-related incidents, injuries, illnesses, diseases and fatalities;
  - Review safety complaints and/or hazardous conditions and forward the results of their review to the ESC and Safety Coordinator within five (5) days;

- Evaluate the effectiveness of the established safety rules, policies and procedures for accident and illness prevention programs;
- Evaluate and determine the effectiveness of engineering controls, administrative controls and personal protective equipment (PPE);
- Establish and communicate safety-related training requirements and needs.

36.4.3 SSC Meetings

- The SSC will meet within 45 days of its inception and no less than bi-monthly.
- Scheduled meeting dates, times and locations will be posted in a conspicuous place.
- SSC meeting minutes will be posted in a conspicuous place and a copy provided to the ESC. Copies will be provided to individual employees, upon request.

36.5 Recordkeeping

36.5.1 Requirements

- Training records, Safety Committee Minutes and written original communications between the Safety Committees and the School District should be maintained on file for three (3) years.
- All written documents as shown should be available for inspection by District employees, their representatives, the Occupational Safety and Health Administration and the State of Florida, if requested.

36.5.2 Records Retention

Record	Maintained By	Retention
Safety Committee Meeting Minutes	**Facility Administration / Environmental Health and Safety Office**	**3 Years + current year**
Original Communication Documentation	**Facility Administration / Environmental Health and Safety Office**	**3 Years + current year**

Section 37: Safety Inspections/Drills

37.1 Workplace Safety Inspections

Overall site inspections are to be conducted using a checklist designed to specifically identify the hazards of each particular work area. Findings are to be documented, reviewed by the Site Safety Committees, Principals and/or Facility Managers and action plans initiated to correct any deficiencies. Monthly Inspection Reports and completed actions are to be kept on file and available for inspection.

Identified deficiencies requiring immediate attention or repair are to be given priority and corrected as soon as possible.

Applicable OSHA Standards **NFPA 101, Chapters 10-11** **EPA and DEP**

37.2 School Inspections and Drills

The School Board of Brevard County has established policies and procedures in order to maintain the health and safety of all occupants within all facilities in its jurisdiction. To ensure compliance with these policies and procedures, both continuous and scheduled periodic inspections will be conducted.

37.2.1 Fire, Casualty and Sanitation Inspections

- The State of Florida requires that each building of each educational and ancillary plant in the School Board's jurisdiction receive the following inspections at least **annually**:
  1) Fire Safety Inspection
  2) Casualty Safety Inspection
  3) Sanitation Inspection
- The above inspections must begin one (1) year after newly constructed, remodeled or renovated buildings have been occupied.
- Reports must be submitted to the board by June 30 of each year.
- A plan for correcting deficiencies must be included in each report.
- Life threatening deficiencies require prompt corrective action by the board or withdrawal of the educational or ancillary facility from use until corrected.
- **Life threatening deficiencies MAY include:**

  Non-functional fire alarm systems;
  Existing non-functional fire sprinkler systems;
  Doors with padlocks or locks, which preclude egress at all times;
  Inadequate exits.

37.2.1 Fire, Casualty and Sanitation Inspections - Continued

- The *Comprehensive Safety Inspection Form* may be used to record the inspection of each building of each plant.

- Reports must be submitted to the board by June 30 of each year.
- The above inspections must begin one (1) year after newly constructed, remodeled or renovated buildings have been occupied.
- Inspection reports must be approved by the Board. A copy, to be retained on file, must be forwarded to the person in charge of the facility inspected.
- Inspection reports must be available for public review.
- A list of corrected deficiencies from the previous fiscal must be retained with the current year's inspection form.
- Qualified local personnel certified by the State Fire Marshal must conduct Fire Safety Inspections.
- Casualty and Sanitation Inspections may be performed by persons proficient in the rules and other standards applicable to safety, comfort and health in existing facilities.

37.2.2 Playground Inspections

37.2.3.1 **Daily and Monthly Inspections** must be made by school administration to ensure that equipment does not pose any imminent danger during daily operations. See the *Playground Safety Section* for inspection criteria and the *Forms Section* for checklists.

38 **Annual Inspections,** with a re-inspection 6 months later are currently conducted by trained inspectors.

If broken or non-compliant equipment is observed, during daily inspections, school administrators should call the Environmental Health and Safety Office and report the danger to the safety officer. An inspector will be sent out immediately and unsafe equipment will be condemned and removed immediately if it poses an imminent danger to children and cannot be economically repaired.

37.2.3 Fire Drills

- During the first two weeks of each school year, two practice drills must be conducted with monthly, unannounced evacuation drills for the remainder of the year.
- Drills must not include any fire extinguishing operations.

37.3 OSHA Workplace Safety Inspections

The following periodic inspections must be completed, if applicable, by all facilities in order to ensure compliance with specific OSHA requirements. It is equally important that "continuous" and "before use" inspections also be completed as indicated throughout this Plan for wheel restraining

devices, aerial platforms, fall protection, personal protective equipment (PPE), welding equipment and tools, etc.

Test/Inspection	Frequency	Responsibility
Evacuation Alarm	Monthly *	Employee/Principals
Bench Grinders	Monthly *	Employee
Cylinders	Monthly *	Employee
Electrical/Electrical Gloves	Monthly/6 Months	Head Custodian/Outside Lab
Eyewash Stations/Safety Showers	Weekly	Employee/Teachers
Fire Drill/Emergency Evacuation	Initial/Monthly	Employee/Principals
Fire Extinguisher, Visual	Monthly *	Employee/Principals
Fire Extinguisher, Complete	Annually	Contractor
Fire Extinguisher, Hydrostatic Test	As Required	Contractor
Fire Suppression Systems	Annually	Contractor
First Aid Kits	Monthly *	Employee
Forklift	Daily	Employee
Hazardous Waste Containers/Area	Weekly/Monthly*	Employee/School Nurse
Housekeeping	Monthly*	Employee
Hydraulic Jacks	Every 6 months	Employee
Ladders/Stairs/Platforms	Before Use/Monthly*	Employee
Lockout/Tagout Observation	Annually	*Authorized* Employee
Overhead Mobile Cranes/Hoists/Equip.	Daily	Employee
Overhead and Mobile Cranes/Hoists/Equip.	Monthly *	Employee
Overhead and Mobile Cranes/Hoists/Equip.	Annually	Contractor
Press Brakes, Shears, Shop Machinery	Periodically	Employee
Respirator	Before Use/Monthly	Employee
Respirator Program Evaluation	Annually	Supervisor
Spray Paint Booth and Filters	Monthly/Quarterly	Employee
Vehicles	Daily	Employee
Ventilation Systems	Daily/Weekly/Monthly	Employee

***Included on Monthly Inspection Report.**

A copy of this Monthly Inspection Report can be found in the *Forms Section* of this Plan.

Date_____

Monthly Inspection Report

MONTHLY SAFETY INSPECTION CHECKLIST

Location_____

1. Housekeeping

‰ Satisfactory	‰ Unsatisfactory	Free of tripping, slipping, falling, etc. hazards
‰ Satisfactory	‰ Unsatisfactory	Area organized, tools in place
‰ Satisfactory	‰ Unsatisfactory	Cleanliness (safety-related)
‰ Satisfactory	‰ Unsatisfactory	Sufficient lighting
‰ Satisfactory	‰ Unsatisfactory	Egress clear

2. Electrical

‰ Satisfactory	‰ Unsatisfactory	Grounding (tools, equipment, etc.)
‰ Satisfactory	‰ Unsatisfactory	Conduit, receptacles, extension cords
‰ Satisfactory	‰ Unsatisfactory	Emergency lighting
‰ Satisfactory	‰ Unsatisfactory	Electrical closets free of storage/Identified
‰ Satisfactory	‰ Unsatisfactory	Tripped circuits/labeled properly

3. Fire Extinguishers

‰ Satisfactory	‰ Unsatisfactory	Readily visible - located in designated place
‰ Satisfactory	‰ Unsatisfactory	Accessible, not obstructed
‰ Satisfactory	‰ Unsatisfactory	Operating instructions legible, facing out
‰ Satisfactory	‰ Unsatisfactory	Fullness checked
‰ Satisfactory	‰ Unsatisfactory	Damage, corrosion, leakage, nozzle OK
‰ Satisfactory	‰ Unsatisfactory	Pressure gauge in operable range
‰ Satisfactory	‰ Unsatisfactory	< 1 year since annual inspection

4. Stairs, Platforms and Ladders

‰ Satisfactory	‰ Unsatisfactory	Railings and toeboards in place
‰ Satisfactory	‰ Unsatisfactory	Ladders - employees inspecting before use
‰ Satisfactory	‰ Unsatisfactory	Ladders - condition, shoes, etc.

5. Safety Devices (guards, safety valves, alarms, etc.)

‰ Satisfactory	‰ Unsatisfactory	In place and adequate
‰ Satisfactory	‰ Unsatisfactory	Serviceable (test alarm - safety valves)

6. Overhead Cranes and Hoists.

‰ Satisfactory	‰ Unsatisfactory	Capacity marked
‰ Satisfactory	‰ Unsatisfactory	Hooks, hoist chains, ropes, connections and slings not cracked/in good condition

7. First Aid Cabinet

‰ Satisfactory	‰ Unsatisfactory	Accessible, used materials replaced

Date_____

Monthly Inspection Report

MONTHLY SAFETY INSPECTION CHECKLIST **Location_____**

8. Hazardous Waste Area

☐ Satisfactory	☐ Unsatisfactory	"No Smoking Signs" posted (if flammable mater materials)
☐ Satisfactory	☐ Unsatisfactory	Containment adequate, good condition
☐ Satisfactory	☐ Unsatisfactory	Containers in good condition, no leaks, etc. (grounded, if flammable liquid)
☐ Satisfactory	☐ Unsatisfactory	Labeling, identification

9. Cylinders

☐ Satisfactory	☐ Unsatisfactory	Properly labeled
☐ Satisfactory	☐ Unsatisfactory	Secured
☐ Satisfactory	☐ Unsatisfactory	"No Smoking" signs in place (if flammable materials)
☐ Satisfactory	☐ Unsatisfactory	Oxygen separated (20 feet) from fuel cylinders
☐ Satisfactory	☐ Unsatisfactory	Good condition
☐ Satisfactory	☐ Unsatisfactory	Valves closed, safety caps
☐ Satisfactory	☐ Unsatisfactory	Empties marked

10. Bench Grinders

☐ Satisfactory	☐ Unsatisfactory	Guards in place
☐ Satisfactory	☐ Unsatisfactory	1/8 inch maximum opening from work rest
☐ Satisfactory	☐ Unsatisfactory	1/4 inch guard to wheel opening

Forward to Site Safety Committee, Principal and/or Facilities Manager for Assignment of Abatement Responsibility.

Unsatisfactory Conditions

Section _____	**Corrective Action**	**Responsibility**	**Date Completed**
Section _____	**Corrective Action**	**Responsibility**	**Date Completed**
Section _____	**Corrective Action**	**Responsibility**	**Date Completed**
Section_____	**Corrective Action**	**Responsibility**	**Date Completed**
Section_____	**Corrective Action**	**Responsibility**	**Date Completed**

Inspection Performed By _____

AFTER COMPLETION: **POSTED** ☐ **Yes** ☐ **No** **FILED** ☐ **Yes** ☐ **No**

RETAIN 12 MONTHS

37.4 Recordkeeping

37.4.1 Records Retention

Record	Maintained By	Retention
Monthly Inspection Report	**Principals or Facility Managers or Designee**	**12 months**
Playground Annual Inspections	**EHS Office / Fire safety and Sanitation Inspectors / NPSI Certified**	**2 Years**
Playground Daily / Monthly Inspections	**School Administrator or Designee**	**2 Years**
Annual Comprehensive Fire Safety Inspection Reports*	**Environmental Health and Safety**	**4 Years**
Annual Casualty Inspection Report*	**Environmental Health and Safety**	**4 Years**
Annual Sanitation Inspection Report*	**Environmental Health and Safety**	**4 Years**

**May be combined into one annual SREF Inspection Report.*

Section 38: Safety Meetings

38.1 Introduction

In order to provide the most up to date safety and health information to employees, the School Board of Brevard County recommends that all facilities conduct periodic Safety Meetings with their employees. Any relevant topic may be selected and Principals and Facility Managers are encouraged to use this Environmental Health and Safety Plan as a guideline. The goal of these meetings should be to instill a sense of safety awareness in employees, ensure compliance with applicable laws and eliminate risky behaviors.

Safety Committee meetings will be held in accordance with State of Florida Requirements. *See the Safety Committee Section of this Plan for additional information.*

38.2 Safety Meetings

38.2.1 General Periodic Safety Meetings

- **Frequency** – Daily – Weekly – Monthly
- **Who must attend** - All Employees (If Job-applicable)
- **Content** – Topics relevant to the safety of employees. All aspects of the safety program, as well as safety performance may be reviewed and plans for continuous improvement discussed.

38.2.2 Site Safety Committee Meetings

- **Frequency** – Bi-monthly
- **Who must attend** - Committee Members
- **Content:** - The SSC will operate solely for the purpose of reviewing hazards, mishaps/accidents and other tasks associated with the workplace safety program.

38.2.3 Executive Safety Committee Meetings:

- **Frequency** – Quarterly
- **Who must attend** - Committee Members
- **Content:** - Evaluate the Site Safety Committees' activities; approve implementation of training programs; and provide reports to the Superintendent regarding the status of the District's safety and health.

39.3 General Periodic Safety Meeting Topics

Principals, Facility Directors and Supervisors may select any relevant safety topic or select one from those listed below.

Safety Meeting Topics		
Accident Causes and Prevention	**Excavations**	**Overhead Cranes and Hoists**
Accident Prevention	**Eye Injury Prevention**	**Personal Protective Equipment**
Asbestos Awareness	**Fire Extinguishers**	**Playground Safety**
Back Care	**Fire Prevention**	**Portable Power Tools**
Back Injury Prevention	**First Aid**	**Respiratory Protection**
Basic Machine Safety	**Forklift Operation**	**Roofing**
Battery Charging Hazards	**GFCI's/Electrical Tool Safety**	**Safe Use of Hand Trucks**
Bench and Pedestal Grinders	**Hand Protection**	**Scaffolding Safety**
Bloodborne Pathogens	**Hand Tool Safety**	**Security**
Chain Saw Safety	**Hazard Recognition**	**Signs, Tags and Hazard Warnings**

Chemical Safety	**Hearing Conservation**	**Silica Dust**
Confined Space Entry	**Heat Stress**	**Slips, Trips and Falls**
Cuts and Burns	**Home Safety**	**Tornadoes**
Driving Safety	**Hurricane Preparedness**	**Ventilation**
Drum Handling	**Job Hazard Analyses**	**Water Safety**
Electrical Hazards	**Ladder Safety**	**Welding Safety**
Eliminating Risky Behaviors	**Lightning Safety**	**Working with Compressed Gases**
Emergency Procedures	**Loose Clothes, Long Hair and Jewelry Hazards**	**Working With Cylinders**
Ergonomics	**Materials Handling**	**Workplace Violence**
Evacuation Plans	**Office Safety**	

38.4 Recordkeeping

38.4.1 Record Retention

Record	Maintained By	Retention
Safety Committee Meeting Minutes	**Facility Administration/ Environmental Health and Safety Office**	**3 Years + current**

Section 39: Sanitation

Employees who work in permanent places of employment, as well as those who work at temporary jobsites, are to be provided sanitary and safe work conditions. In addition, school requirements for sanitation must be met. The following information provides guidelines to be followed to ensure that required facilities and materials are provided and maintained. Additional information can be found in the *Housekeeping Section* of this Plan.

Please see the *Emergency/Disaster Feeding Procedures* and *Water Outage Procedures for School Board of Brevard County*. This information may be obtained from the Food Services Department or the Environmental Health and Safety Office.

29 CFR 1910.141 **29 CFR 1926.51** **F.S. 64E-13**

39.1 Permanent Places of Employment

39.1.1 Water Supply

- Potable water, or water meeting the quality standards prescribed for drinking water by State or local authorities, is to be supplied to employees and is to be used for drinking, personal, eyewash, safety showering and culinary purposes.
- Outlets for nonpotable water, such as water for industrial or firefighting purposes, must be posted and marked to indicate that it is unsafe for drinking, personal, eyewash, safety showering and culinary purposes.
- Nonpotable water systems must be designed to prevent backflow into any potable water system.
- Unless an approved air gap or backflow prevention device is provided, no plumbing fixture, device or equipment is to be connected to any potable water supply if it may pollute water supplies or provide a cross-connection with non-potable water.

39.1.2 Portable Drinking Water

- If portable drinking water dispensers are used, they must be closable and designed and serviced so that sanitary conditions are maintained.
- A dispensing tap must be provided; dipping or pouring is not allowed and common drinking cups cannot be used.

39.1 Permanent Places of Employment - Continued

39.1.3 Toilet Facilities

- An adequate number of toilet rooms, separate for each sex, must be provided. *Separate rooms are not required, if rooms will be occupied by not more than one person at a time, contain a water closet and can be locked from the inside.*

This does not apply to mobile crews or to normally unattended work locations if they have immediate transportation available to nearby toilet facilities.

39.1.4 Washing Facilities

- A lavatory, washbasin or similar vessel must be made available in all places of employment and maintained in a sanitary condition.
- Washing facilities must have hot and cold or tepid running water as well as soap or other cleansing agents.
- Individual hand towels, warm air blowers or continuous cloth toweling must be available.

This does not apply to mobile crews or to normally unattended work locations if employees working at these locations have transportation available to nearby washing facilities.

39.1.5 Showers

If a shower is required by a particular standard, (i.e., asbestos) it must meet the following criteria:

- √ One shower for each ten (10) employees of each sex must be provided;
- √ Individual clean towels and body soap or a cleansing agent must be available; and
- √ Showers must be equipped with hot and cold running water.

39.1.6 Food and Beverage Consumption and Preparation

- Eating and drinking in toilet rooms or areas exposed to toxic materials is not allowed.
- Waste containers for disposal of food and beverage waste must be smooth, corrosion resistant, easily cleaned or disposable.
- If used, waste containers need to be emptied at least once a day and maintained in a clean and sanitary condition. Tight-fitting, solid covers are to be used unless sanitary conditions can be maintained without their use.
- Food and beverages cannot be stored in toilet rooms or areas exposed to toxic materials.
- All employee food service facilities and operations must be carried out in accordance with sound hygienic principles. The food dispensed must be wholesome, free from spoilage and processed, prepared, handled and stored to protect against contamination.

39.2 Temporary Places of Employment

39.2.1 Water Supply

- Potable water must be provided in all places of temporary employment.
- Drinking water containers must be clearly marked and used for drinking only.
- Containers must be capable of being tightly closed and equipped with a tap. *Dipping or pouring from containers and common drinking cups is not allowed.*
- If single service cups are used, a sanitary holding container must be available along with a receptacle for their disposal after use.
- Nonpotable water outlets must be identified by signs to indicate that it is unsafe for drinking, washing or cooking purposes.
- There can be no cross-connection, open or potential, between a potable and nonpotable system.

39.2.2 Toilets at Construction Sites

The following requirements do not apply to mobile crews having transportation readily available to nearby toilet facilities:

- One toilet must be provided for 20 or less employees. For more than 20 employees, toilets must be available in accordance with Table D-1 in *OSHA 29 CFR 1926.51.*
- Job sites without a sanitary sewer must be provided with one of the following:
  1) Chemical toilets;
  2) Recirculating toilets;
  3) Combustion toilets.

39.2.3 Washing Facilities

- Washing facilities must be provided for employees if they apply paints, coatings, herbicides or insecticides or perform operations with exposure to harmful contaminants.
- The facilities must be near the worksite, equipped to remove such substances and maintained in a sanitary condition.

39.2.4 Food and Beverage Consumption and Preparation

- Eating and drinking in toilet rooms or areas exposed to toxic materials is not allowed.

39.3 School Sanitation

39.3.1 Water Supply

- Approved, sanitary slant jet type drinking fountains must be provided in a number appropriate to the building code. *Fountains may not be located in toilet rooms.*
- Pitcher pumps cannot be used on any school water supply.

39.3.2 Toilet Facilities

- Toilets must be provided for all occupants. They must be conveniently located, kept clean and in good repair.
- Faculty and staff will be provided facilities in separate rooms from those provided students.
- Toilet facilities must be accessible under a continuous roof cover from all student occupied spaces. Access to group toilets cannot be through an occupied space.
- All group toilet rooms must be provided with at least one (1) floor drain and one hose bib. They must be sloped to the drain.
- Floors, partitions and walls up to four (4) feet must be finished with impervious materials.
- In group toilet rooms, a partition is necessary between each water closet and each must have a door. Entrance doors must be self-locking and have some method of shielding occupants from view when opened.

39.3.3 Handwashing Facilities

- Handwashing facilities must be provided for all occupants and located within or adjoining each toilet room.

- Soap dispensers must be provided at each basin and liquid or powered soap used along with individual towels (preferably paper) or hot air dryers. *Common or public towels cannot be used.*
- Faculty and staff will be provided facilities in separate rooms from those provided students.

39.3.4 Shower Facilities

- Shower facilities must be provided in all secondary schools where physical education is required. They should be considered, if applicable, for elementary schools.

39.3.4 Shower Facilities – Continued

- Shower rooms and stall floors, walls (up to 6 feet), and partitions must be finished with dense, non-absorbent and non-corrosive materials having a smooth impervious surface.
- One shower head per five (5) pupils must be provided.
- Floors must be drained so that waste water from any shower head will not pass over areas occupied by other bathers.
- Water must be heated and the temperature at the shower head less than 110 degrees F.
- Showers must be kept clean and free of mildew.

39.3.5 Inspections

- At least one sanitation inspection of each building within the School Board of Brevard County's jurisdiction **must be conducted each year** to ensure compliance.
- Records of these inspections are to be maintained for review. (May be included in the **Annual** Fire Safety, Casualty Safety, and Sanitation Inspection)

39.4 Recordkeeping

39.4.1 Records Retention

Record	Maintained By	Retention
Inspections *	**Principals and Facility Supervisors**	**Most Current**
Annual Comprehensive Fire Safety, Casualty and Sanitation Report	**Environmental Health and Safety Office**	**4 Years**

See Monthly Inspection Report

Section 40: Science Education Safety

40.1 Introduction

The information provided in this Section of the Environmental Health and Safety Plan is based upon the information found in the Brevard Public School's *Safe Science: Science Safety for Schools* manual. The goal of this Section is to include the information necessary for instructors to promote and provide safe, hands-on learning experiences for students.

Safe Science: Science Safety for Schools

40.2 Emergencies

In the event that an accident or incident occurs during an instructional activity, the instructor must be prepared to handle the situation in a calm, professional manner.

40.2.1 General

- Instructors should be familiar with the School Board of Brevard County's Emergency Procedures along with those for the local facility. (See the *Emergency Procedures Section* of this Plan)
- Ensure that the school or facility Evacuation Plan is posted and review periodically with students.
- An administrator should always be notified when a laboratory accident occurs.
- ***If a life-threatening emergency occurs, the instructor should call 9-1-1 immediately.***

40.2.2 Potential Emergencies and Responses

- **Burns**

  1) Flush with cold water and perform immediate first aid.
  2) Contact the school nurse or an administrator, if appropriate.

- **Eye Injury**

  1) Hold the lids open and flush with cold water for at least 15 minutes if a chemical is splashed or rubbed into the eye.
  2) Do not rub the eye if a foreign object gets in it.
  3) Contact the school nurse or an administrator.

- **Minor Cuts**

  1) Wash with soap and water.
  2) Contact the school nurse or an administrator, if appropriate.

Section 40: Science Education Safety

40.2 Emergencies - Continued

40.2.2 Potential Emergencies and Responses - Continued

- **Fainting**

1) Get the student to fresh air and position the head lower than the feet.
2) Perform artificial resuscitation if breathing stops.
3) Contact the school nurse or an administrator, if appropriate.

- **Poisoning**

1) Contact the school nurse and an administrator.
2) If life threatening, call **9-1-1.**
3) Call the Florida Poison Information for information at 1-800-282-3171. Be prepared to identify:
   - √ The toxic chemical;
   - √ The amount ingested, or inhaled;
   - √ The concentration.
4) Notify the parents as soon as possible.

- **Chemical Spills**

1) Instructors should never attempt to deal with a chemical spill, if it could present any significant threat to health or safety. ***Call 9-1-1 and contact the administrator if the spill is "significant".***
2) An instructor may respond to a small chemical spill, if it poses no significant health or safety hazard to the faculty or students.
3) In the event of a small spill:
   - √ Evacuate the area;
   - √ Turn off gas outlets at the master gas shutoff button;
   - √ Turn off electricity to lab tables at the master electrical shutoff button;
   - √ Notify the principal immediately and inform him of:
     - The location of the spill;
     - The name of the spilled substance;
     - An approximate quantity spilled;
     - Any other pertinent information.
4) Use the appropriate PPE (See the MSDS).
5) Absorb liquids with appropriate absorbing material.
6) Pick up materials with a non-sparking tool.
7) Place materials in a suitable storage container and label.
8) Wash the affected area with soap or water.
9) Dispose of or decontaminate protective equipment or cleaning materials.
10) Consult the *Approved Chemical List* for the proper disposal methods and coordinate with the appropriate administrator.

Section 40: Science Education Safety

40.2 Emergencies - Continued

40.2.2 Potential Emergencies and Responses - Continued

- **Fires**

1) Instructors should never attempt to extinguish a fire, unless:
   - √ The fire is small;
   - √ They are trained to use a fire extinguisher;
   - √ Their exit is not blocked;
   - √ And it is safe to do so.
2) If there is a fire, an instructor should:
   - √ Sound the alarm;
   - √ Evacuate the students to the designated assembly area;
   - √ Shut off the gas and electricity to lab tables, if possible to do so safely;
   - √ Initiate and follow the facility's *Emergency Procedures*.

40.3 Laboratory Safety

40.3.1 General Chemical Safety

When working in a lab, students may be exposed to hazardous chemicals by inhaling them, ingesting them or absorbing them through their skin or mucous membranes. In order to prevent such exposures, the following procedures must be adhered to at all times.

1) Review the Material Safety Data Sheets (MSDSs) for all chemicals used.
2) Read the warning labels on all chemical containers before use.
3) Pay special attention to the specific hazards, flammability, reactivity, conditions of use and precautionary measures to be taken to ensure safe handling.
4) Wear eye protection, gloves and protective clothing as required to protect against splashing during the preparation and use of reagents and/or corrosives.
5) If an alternative chemical and equipment must be substituted for those recommended in the laboratory manual, the teacher should perform all experiments prior to allowing students to perform them. Additional potential hazards and safety precautions should be noted and students informed.
6) Students should never handle, taste, or smell a chemical unless directed to do so by the teacher. To smell the contents of a test tube or other container, student should be instructed to waft some of the escaping vapors towards themselves. *Never bring the container close to the nose.*
7) Use a fume hood when working with toxic or flammable chemicals.
8) Wash hands thoroughly after working with chemicals.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.2 Chemistry Experiments – Specific Hazards

The U. S. Department of Health has classified general categories of chemistry experiments according to their health and safety hazards as shown below.

Class of Experiment	Hazards	Safe Procedures
Acids and Bases	√ Dilution of acids √ Pipetting procedures √ Filling glassware	√ The Teacher should dilute acids or bases before the lab. √ If the student must dilute the reagents, the acid should always be added to the water. Remember, "Always Add Acid"! √ Perform dilution in a shielded fume hood in a heat resistant beaker immersed in an ice bath. √ Use extreme care to avoid splashing highly corrosive acids or bases on the skin or into the eyes. √ Wear PPE, such as gloves and safety glasses.
Chemical and Physical Change	√ Ultraviolet light	√ When burning magnesium and aluminum, do not look directly at the flame.
Conductivity and Ionization	√ Shock	√ Limit the use of active metals. √ Use extreme care when using conductivity apparatus with exposed electrodes. √ Limit voltage. √ Follow lab safety procedures.
Crystals	√ Inhalation hazards √ Ingestion of crystals	√ If sublimation of iodine is done, carry out procedure in fume hood. √ Use care if attractively colored crystals are grown, they could be mistaken for candies. √ Crystal kits should contain only approved chemicals.
Density Measurements	√ Glassware breakage	√ If the density of organic liquids is to be determined, some safe liquids to use are glycerol or aliphatic alcohols of larger molecular weights. √ If the density of air is to be determined, evacuated glassware must have appropriate thick-walled construction and must be taped to minimize damage in case of implosion.
Gas Laws	√ Extreme cold	√ Use proper gloves, protective eyewear and protective clothing. √ Ensure adequate ventilation.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.2 Chemistry Experiments – Specific Hazards - Continued

Class of Experiment	Hazards	Safe Procedures
Heat of Reaction	√ Reagents (Caustics, corrosives)	√ If hydroxides are used, students must understand NEVER to touch the pellets with their fingers. √ Contact lenses must not be worn since eyes are particularly vulnerable to hydroxides and acids. √ Injuries may also result from using the thermometer as a stirring rod and from ingesting any of the chemicals.
Organic Chemistry	√ Volatility and flammability of organics	√ Reduce hazards with ventilation, lower risk by using a fume hood. √ Using hot plates for heating, if possible.
Oxidation and Reduction	√ Chronic health hazards √ Inhalation √ Corrosives	√ Use cobalt compounds in redox reactions in place of chromium compounds. √ Use dilute solutions to reduce risk. √ If gases will be generated during reactions, use a fume hood. √ If concentrated acid must be used, wear personal protective equipment as needed and use extreme caution. √ Use extreme care when disposing of redox chemicals. Follow the recommendations on the MSDS for the specific substance.
Qualitative Analysis	√ Acids (corrosives)	√ Distribute dilute solutions in dropper bottles. √ If concentrated acid must be used, wear personal protective equipment as needed and use extreme caution.
Radiation Analysis	√ Radiation	√ Experiments in this class are usually not performed in a school setting. √ If experiments with radiation are included, care should be exercised with pipetting, chemical handling and equipment use. (e.g., radiation detectors.)
Reaction Rates	√ Reagents (corrosives)	√ Give students reagents in diluted form to reduce hazards.
Thermal Chemical Measurements	√ Reagents (corrosives)	√ Use only chemicals on the *Approved Chemicals List*. (Replace those normally used that are flammable, toxic or carcinogenic.) √ Use water baths in place of open flames, if possible.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.2 Chemistry Experiments – Specific Hazards - Continued

Class of Experiment	Hazards	Safe Procedures
Stoichiometric Reactions	√ Hot Acids (corrosives) √ Potential explosion	√ All nitric acid dissolution and reactions should be carried out in a fume hood. √ Since hot acid produces worse burns than cold acid, extra care should be used if the reagents are heated. √ Whenever gas generators are used, they must be properly vented to avoid increased internal pressure that can cause an explosion. √ NEVER LEAVE GAS GENERATOR REACTIONS UNATTENDED! √ Prepare solutions for these labs in advance to reduce potential dangers.
Production of Hydrogen	√ Flammables, explosives.	√ Since hydrogen/air mixtures can be explosive, be sure that there is no open flame near the generator. √ It is recommended that a hydrogen jet not be ignited.
Reaction of active Metals with Water	√ Potential explosion	√ If the reaction of active metals with water is to be demonstrated, use calcium metal in place of alkali metals.

40.3.3 Chemical Use in Biology

Chemicals used in the biology laboratory may be reactive, flammable, and potentially carcinogenic. Although many are non-hazardous and require no special precautions, safe procedures should be followed when using ANY chemicals. The following table lists the chemicals that are frequently used in biological applications along with recommended safe procedures for their use.

Chemical(s)	Hazards	Safe Procedures
Acetone – Used as a general solvent and in experiments involving paper chromatography.	√ Flammable √ May produce explosive vapor √ Inhalation may produce narcosis √ Contact with the skin or eyes or by ingestion is toxic	√ Use in well-ventilated areas. √ If possible, dispense in small containers under a fume hood. √ Wear chemical-resistant gloves (e.g., nitrile) to provide skin protection. √ Wear safety glasses if splashing could occur.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.3 Chemical Use in Biology – Continued

Chemical(s)	Hazards	Safe Procedures
Adrenaline	√ May be toxic by ingestion	√ Wash hands thoroughly after use.
Antibiotics	√ Students may have allergic reactions to antibiotics used	√ Avoid handling antibiotic discs or antibiotic solutions when testing the resistance of bacteria, if an allergy is known or suspected.
Benedict's Qualitative Solution	√ May be toxic √ Caustic	√ Contains copper II sulfate. When used in the identification of reducing sugars, avoid skin and eye exposure. √ Hazards increase when solution is heated.
Biuret Reagent	√ Caustic (corrosive)	√ Contains sodium hydroxide, a caustic. √ Use eye protection and protect avoid skin exposure. √ Heat increases hazards.
Bleach	√ Irritant √ Will react violently with acids √ Forms toxic fumes in the presence of ammonia	√ Used as a disinfectant in seed germination experiments and in skeletal preparations in the biology lab. (10% solution of bleach in water) √ Read labels of all cleaning agents used with bleach and ensure that they are compatible. AVOID PRODUCTS CONTAINING AMMONIA! √ Avoid skin and eye exposure.
Buffer Solutions	√ Corrosive	√ Buffer solutions that stabilize solutions at high and low pH are strongly alkaline and acidic. √ Treat as strong acids or bases. √ Avoid skin and eye exposure.
Fehling's Solutions A and B	√ Caustic (corrosive) √ Toxic	√ Use in the identification of reducing sugars. √ Avoid skin and eye exposure. √ Heat increases hazards.
Hydrogen Peroxide	√ Skin and eye irritant	√ 3% solution is usually used. Normally weak but consider an eye and skin irritant.
Iodine Solutions	√ Corrosive √ Toxic	√ In elemental form, or in a solution, as in Gram's Iodine, Lugol's Iodine, or iodine-potassium-iodide solutions, solutions are toxic and corrosive. Avoid contact with eyes and skin.
Limewater	√ Mild skin irritant	√ Used as a common laboratory test for carbon dioxide. √ Avoid skin and eye exposure.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.3 Chemical Use in Biology – Continued

Chemical(s)	Hazards	Safe Procedures
Ninhydrin	√ Severe irritant √ Flammable (because of the butanol carrier) √ Serious health hazard in vapor form	√ Avoid inhaling the vapor, especially when dispensed from an aerosol can. √ THIS CHEMICAL IS NOT ON THE APPROVED CHEMICAL LIST. √ Avoid skin and eye exposure.
Penicillin	√ Students may have allergic reactions	√ Avoid handling penicillin solutions, or impregnated discs when testing the resistance of bacteria, if an allergy is known or suspected.
Petroleum Ether	√ Flammable √ Inhalation may produce narcosis	√ Use in well-ventilated areas. √ Contains low molecular weight alkanes, and is often used as a solvent in plant pigment chromatography experiments.
Plant Growth Hormones	√ Chronic health hazard – mutagenic	√ Indole-3-acetic Acid (IAA), 3-indolebutyric acid (IBA), and gibberellic acid are possible mutagens and must be handled cautiously. Both IAA and IBA are contained in commercially available rooting powders. √ Inhalation of the dust or contact with the skin should be avoided.
Potassium Hydroxide	√ Caustic (corrosive) √ Toxic	√ Used to absorb carbon dioxide in cellular respiration experiments and to clear tissues for subsequent staining. √ Use gloves and eye protection. √ Avoid contact with skin or eyes.
Stains	√ Flammable √ Inhalation may produce narcosis	√ Many staining solutions contain staining agents dissolved in acetone or alcohol. √ Use in well-ventilated areas. √ Avoid contact with skin and eyes.
Thymol	√ Irritant	√ Occasionally used as an antifungal agent when preserving specimens. √ Irritating to mucous membranes. √ Use under well-ventilated conditions.
Triethylamine	√ Flammable √ Irritant	√ This is the active ingredient in insect anesthetics such as Fly-Nap and Lull-A-Fly. It is flammable and irritating to the eyes, skin and respiratory tract. √ Use in well-ventilated areas. √ Avoid inhalation and skin and eye contact.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.4 Laboratory Equipment

- **Assembling Apparatus**
  1) Keep work spaces uncluttered. Only authorized materials should be present. Keep work space clear of chemical containers and scraps of paper.
  2) Keep tall measuring equipment, such as glass cylinders, near the rear of the work space where they will not be easily knocked over.
  3) When attaching equipment to a ring stand, position it so that the center of gravity of the system is over the base, with adequate provision for removing burners or baths.
  4) Thoroughly check glassware assembly and auxiliary equipment prior to adding reagents and carrying out any reactions.
  5) Whenever possible, use hot plats in place of open flame burners.

- **Centrifuges**
  1) Centrifuging should be done in a location where vibrations will not cause bottles or equipment to fall off shelves.
  2) Suction cups must be in good condition and capable of firmly gripping the laboratory bench.
  3) Students must be taught to correctly balance the rotor before starting the motor to minimize vibration.
  4) The rotor must be completely stopped before removing the tubes.
  5) Centrifuge tubes should match the contour of the metal sleeves.

- **Chromatography**
  1) Special precautions should be taken when working with solvents. Make sure to close solvent containers after use.
  2) Dispose of all waste solvents properly.

- **Compressed Gas Cylinders**
  1) Cylinders inside buildings must be stored at least twenty feet from highly combustible materials and placed in a secure, temperature-controlled environment.
  2) Empty cylinders must have valves closed while in storage or shipment.
  3) Valve caps must be in place if cylinders are not in service.
  4) When in storage, oxygen cylinders must be separated from fuel gas cylinders by twenty feet or a noncombustible barrier at least five feet high having a thirty-minute fire resistance.
  5) Compressed gas cylinders must be secured with a chain or base to prevent accidental overturning.
  6) Gas cylinders must be operated, handled and stored according to NFPA 51, *Standard for the Design and Installation of Oxygen –fuel Gas Systems for Welding, Cutting and Allied Processes (1983).* See the *Welding Safety Section* of the Plan for additional information.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.4 Laboratory Equipment - Continued

- **Deionizing Cartridges**
  1) Intended to remove cations and organics from tap water, usually designed to work at low water pressures. High water pressures may cause the cartridge to explode.
  2) Instructors must read the manufacturer's instructions carefully to determine the recommended flow**.**

- **Electrical Equipment/Electricity**

Electricity is a potential hazard in the laboratory because of the possibility of shock or fire. Although low voltage direct current (0-12 volt DC) sources are most frequently used in the science laboratory, there are potential hazards associated with any electrical device. Most science laboratories are equipped with electrical outlets of 120 and 240 Volts AC and extreme care must be used around any electrical outlet.

Some of the basic conditions for safe use of electricity are listed below:

1) Avoid moisture, keep hands and skin dry when handling electrical equipment or components. Stand on a dry surface.
2) There must be a master cut-off switch for the electrical supply or the location of such a switch must be posted.
3) Insulated materials must be placed on the floor when using equipment that generates electricity.
4) Service outlets must be three-prong with proper grounding.
5) Circuits in the proximity of water splash areas must be equipped with a ground fault circuit interrupter (GFCI).
6) Caution students about the dangers of grasping electric wires improperly. *Remind them that electrical shock remains a possibility even when voltage is low, particularly if the skin is broken or the connecting wire creates a puncture wound.*
7) Check the insulation of all equipment, wires, plugs and outlets before any connection is made.
8) Do not use switches or equipment that may produce sparks near any volatile, flammable substances.
9) Properly discharge a capacitor or Leyden jar before handling.
10) Be aware that experiments with resistive heating may produce high temperatures.

- **Electrophoresis**
  1) Electrophoresis experiments are potentially very hazardous because of the presence of ionic solutions in proximity to high voltage and currents.
  2) Never disconnect the leads from the electrophoresis box with the power supply turned on.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.4 Laboratory Equipment - Continued

- **Glassware**

1) Glassware should never be used for any purpose other than that for which it is specifically designed.
2) Care should be taken to ensue that glassware selected is appropriate for the laboratory activities for which it is to be used.
3) Borosilicate glassware (Pyrex or Kimax) should be used for all laboratory experiments unless otherwise indicated.
4) All glassware should be inspected for nicks, cracks and jagged edges. Broken glassware should be disposed of carefully in a specifically marked container. *Small pieces and shards of glass should be swept up with a dustpan or picked up with dampened paper towels, never fingers.*
5) When heated over a flame, glass apparatus should be placed on wire gauze.
6) A Pyrex or Kimax glass test tube can be heated directly as long as it is heated at approximately a 45-degree angle with its mouth pointed away from people.
7) Never heat a closed system, such as a stoppered flask or stoppered test tube.
8) Students should be reminded that glass retains heat. Any glass that has been heated should never be placed in direct contact with a tabletop, but rather on a ceramic wire gauze screen. Extra care should be taken when fire polishing and bending glass tubing.
9) Students must never eat or drink from laboratory glassware.
10) Graduated cylinders should have plastic bumpers near the top lip. The bumpers are not to be used as quantity indicators, but are to prevent breakage if the cylinder is accidentally knocked over.
11) Frozen glass-to-glass surfaces and glass tubing adhered to rubber present a particular hazard unless extreme care and patience are exercised.

- **Glass Tubing/Rods**

Whenever glass tubing must be prepared by the student for use in the laboratory, the following safety procedures should be observed to reduce the risk of laboratory accidents.

1) ***Cutting soft glass tubing***
   - √ Place the length of soft glass tubing flat on the laboratory table. Make a deep scratch across the tubing, using the cutting edge of a sharp triangular file.
   - √ Wrap the scratched glass with either a cloth or damp paper towel as well as wearing an apron, gloves and goggles or a face shield. Align both thumbs directly over the scratch and “snap” the tubing by pushing thumbs outward. *Glass must be pointed away from any other persons, as it is broken.*
   - √ Do not use force if the glass does not break easily. Deepen the scratch with another stroke of the file and the glass should break easily.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.4 Laboratory Equipment - Continued

- **Glass Tubing/Rods - Continued**

2) ***Fire polishing the cut ends of the tubing***
   - √ Light the burner and adjust the air supply so that two blue cones are visible in the flame. This is considered to be a hot flame.
   - √ Holding the glass tubing horizontally, place the cut end at the tip of the inner blue cone and rotate constantly. An orange colored flame indicates that the glass is melting.
   - √ Constant rotation will assure that the melted glass evenly coats the edge being fire polished.
   - √ Cool 5-10 minutes on a ceramic mat before polishing the other end of the tubing.

3) ***Inserting glass tubing/thermometers into holed stoppers***
   - √ Use a slit stopper or thermometer clips.
   - √ Never attempt to force tubing through a hole that is too small for the tubing.
   - √ Glass tubing or thermometers must be inserted into stoppers and hoses by using a drop of glycerin or water on both the tubing and stopper.
   - √ Wrap the tubing and the stopper in layers of cloth or paper towel to protect the hands if the glass shatters in spite of precautions.
   - √ Slowly and gently work the tube into the stopper with a twisting motion. Do not hurry.

4) ***Removing glass tubing/thermometers from holed stoppers***
   - √ Remove stopper as soon as possible to avoid “freezing” the tubing in the stopper.
   - √ If freezing occurs, soak tubing and stopper overnight in soapy water before attempting to remove tubing.
   - √ If a tube or thermometer cannot be removed, it may be necessary to cut the stopper.

- **Heating Equipment**

1) Whenever a heating agent is used in the laboratory, students and teachers should be properly attired for safety.
2) The location of fire safety equipment and techniques for their use must be clearly communicated.
3) Laboratories should be properly vented.
4) Volatile or pulverized materials are easily ignited by open flames and intense heat can burn hair, clothing or skin.
5) When flammable liquids such as alcohol are being used, all flames in the laboratory should be extinguished.
6) An operating heating agent should NEVER be left unattended.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.4 Laboratory Equipment - Continued

- **Heating Equipment - Continued**

7) ***Alcohol Burners***
   - √ Ethyl alcohol with a pinch of sodium chloride (to make the flame more visible) is the fuel of choice because of its high flashpoint. Do not use methyl alcohol, duplicating fluid, or any flammable liquid other than ethyl alcohol.
   - √ The lamps should be filled from a small squeeze bottle rather than from a large open container of fuel and should never be filled in the same room in which any flame is present.
   - √ They should be placed on a non-flammable surface or in a pan of sand. Once lit, the lamps must never be carried from place to place.
   - √ The teacher should inspect the wicks periodically to make sure that they are kept trimmed and short.
   - √ Students should be cautioned to make sure that no fuel is present on the outside of the lamp and that the top is screwed on tightly before ignition.
   - √ Extinguish the burner by placing a glass or metal cap over the flame at an angle from the side. Caps should remain in place when the burner is not in use.
   - √ Emptying the burners of fuel before storing is recommended.

8) ***Candles***
   - √ Candles should be placed on a stable, non-flammable surface, such as a metal jar lid, a small metal tray or in a pan of sand.
   - √ Students should be cautioned to avoid contact with hot wax.

9) ***Canned Heat***
   - √ Not recommended as a heat source for use by students.
   - √ Canned heat sources (such as Sterno) may be used by the teacher to demonstrate heat energy from a fuel. Make sure arrangement is stable and extinguish it when not in use.

10) ***Gas Burners***
   - √ It is important that students understand how to operate gas burners before using them. The location and function of the gas supply inlet, air adjustment vent/valve, and gas adjustment valve should be clearly communicated.
   - √ Rubber tubing should be inspected periodically for cracks and hardening.
   - √ Portable propane burners are less stable than Bunsen burners and produce a much hotter flame. The heat is sufficient to melt porcelain crucibles. Their use by students is discouraged.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.4 Laboratory Equipment - Continued

- **Heating Equipment - Continued**

11) ***Hot Plates***

- √ Only hot plates designed for laboratory applications should be purchased for student use. The heating element should be fully enclosed. There should be an indicator light showing when the hot plate is on and the power cord should be grounded.
- √ Hot plates should be plugged into a GFCI protected circuit. Be careful to keep the cord away from water sources or the hot surface.
- √ When using the hot plate check for properly working thermostats to prevent dangerous overheating. Use only heat-resistant gloves and/or tongs when placing or removing samples from heating apparatus.
- √ When the laboratory exercise is completed, allow sufficient time for the device to cool; warn students to be wary of the residual heat. When the hot plate is cool, clean the surface with steel wool or a damp cloth, making sure the power source is disconnected from the wall outlet.

12) ***Steam Generating Equipment***

There are some particular hazards that are associated with steam heating apparatus not encountered with open flames. The extreme pressures and temperatures are hazardous if not properly controlled.

- √ Steam generators must be inspected periodically to ensure that openings and vents are clear. If the container openings are blocked, the container may explode.
- √ Pressure cookers, steam generators, distillers, autoclaves, sterilizers and other such devices usually have accompanying instruction manuals. Anyone using such equipment should be familiar with its operation and the specific precautions listed by the manufacturer.
- √ Pressure relief valves should be tested before each use to ensure smooth operation. Final pressure should never exceed 184kPa (20 psi). The pressure in an autoclave must be allowed to gradually return to normal atmospheric pressure on its own.
- √ Even when pressure gauges read zero, the pressure relief valve should be opened prior to opening the door or lid. Caution should be exercised when opening to avoid escaping steam.

13) ***Immersion Heaters***

- √ Immersion heaters other than aquarium heaters are not permitted in the lab.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.4 Laboratory Equipment - Continued

- **Heating Equipment - Continued**

14) ***Incubators***
- √ Care must be taken to avoid breaking the thermometer when placing containers in the incubator.
- √ The incubator must have a UL approved, grounded plug. GFCI protected service should be used.
- √ Students should be cautioned never to touch the heating element.

- **Insect Killing Jars**

1) Any wide-mouthed jar, which can be tightly closed, is acceptable. The anesthetic should be ethyl alcohol or triethylamine (Fly Nap, Lull-A-Fly) and should be placed on a tissue or paper towel at the bottom of the jar. The saturated medium should then be covered with a clean tissue to keep the insect dry.
2) Insect killing jars should be labeled with the name of the chemical used and with the words *Danger: Poisonous Fumes*. The teacher should store them in the same manner as any hazardous chemical container.

- **Light Sources/Lenses/Mirrors**

1) Lenses and mirrors must be inspected for chips and cracks.
2) Lasers used in the classroom must be of low power (Class II or IIIa).
3) Prolonged exposure to reflections from door knobs, glass plates, diamonds or other polished surfaces can cause retinal damage.
4) When UV light is used, appropriate UV protective safety goggles must be worn if there is any possibility of direct exposure to the ultraviolet rays.
5) Strobe lights can trigger seizures in susceptible people. Caution students not to look directly at the strobe.

- **Microscopes and Telescopes**

1) A microscope's mirror should never be aimed directly at the sun. If an electric illuminator is used, it should be grounded or UL approved and plugged into a GFCI protected circuit.
2) Telescopes without proper filters should not be used to examine bright objects such as the sun.
3) Lenses may be disinfected with an alcohol-based lens cleaner.

- **Plastics**

1) Plastic containers should never be used for any purpose other than that for which they are specifically designed. The integrity of plasticware cannot be maintained in temperature extremes.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.4 Laboratory Equipment – Continued

- **Refrigerators**
  1) Foods for human consumption should never be kept in laboratory refrigerators.
  2) Flammable solvents should not be kept in a refrigerator unless it is specifically designed to be "explosion-proof".

- **Thermometers**
  1) Mercury thermometers are not permitted.
  2) Anti-roll devices should be placed on thermometers so that they do not roll off a counter.
  3) Use a rubber safety grip when inserting a thermometer into a stopper and lubricate the end of the thermometer before insertion. The teacher, not the student, should remove a thermometer stuck in a stopper. This can be done by slitting the stopper or inserting a cork borer.

40.3.5 Safety Equipment

- **Laboratory Dress**

To promote safety in the school laboratory setting, students, teachers, and visitors should dress in a manner that will reduce the likelihood of an accident and also serve as a protective barrier in the event of an accident.

1) ***Closed-toe Shoes***
   √ Closed-toe shoes must be worn. This provides a protective barrier against broken glassware and chemical spills.

2) ***Clothing***
   √ Loose fitting clothing with bulky sleeves should be avoided. Cotton shirts and blouses are preferable to synthetic materials that tend to be more reactive to certain chemicals and will burn rapidly and melt if caught on fire.

3) ***Contact Lenses***
   √ Students should be made aware of the possible hazards associated with wearing contact lenses. Soft contact lenses have a potential of reacting with vapors produced during a lab. Both soft and hard contacts have a tendency to absorb and concentrate liquids and vapors behind the lens. Contacts also impair the cleansing of the eyes in case of a chemical splash. May be worn if no hazards are present.

4) ***Long hair***
   √ Long hair should be tied back and dangling jewelry should be restrained or removed.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.5 Safety Equipment - Continued

- **Personal Protection Equipment**

It is the responsibility of the school to provide special protective attire and to require its use during classroom laboratory activities involving chemicals, heating agents or potentially flying agents.

1) ***Aprons***
   - √ Chemical resistant laboratory aprons should be provided to protect clothing and underlying skin from chemicals spills and splattering.

2) ***Gloves***
   - √ Hands should be protected by using the correct type of chemical resistant gloves or heat resistant gloves when necessary.

3) ***Face Shields***
   - √ Eye protection must be worn during certain laboratory activities and teacher demonstrations. Face shields are designed to protect the eyes, face, neck and ears from splashes, flying objects and material fragments. Face shields do not provide protection against hazardous mists and vapors.

4) ***Goggles***
   - √ Goggles with cupped side vents are designed to protect the eyes from chemical mists, splashes and splattering, flying objects and material fragments.
   - √ Goggles must be sanitized and cleaned before each use. Goggles may be sanitized by placing them in an UV sanitizing cabinet or by dunking them into a bucket of Lysol solution (20 mL of Lysol per liter of deionized water) and allowing them to air dry.

- **Science Laboratory and Demonstration Room Safety Equipment**

It is the responsibility of the school to equip all science classrooms with proper safety equipment. Students should know where they are located and how to use them. Good laboratory practice requires regular inspection of the equipment by the teacher to insure the equipment is in good working order.

Rooms used for laboratory investigations should be equipped with the following items.

1) ABC type fire extinguisher*
2) Bucket of dry silica sand for dry chemical fires
3) Chemical spill control kit

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.5 Safety Equipment - Continued

- **Science Laboratory and Demonstration Room Safety Equipment - Continued**

Rooms used for laboratory investigations should be equipped with the following items: - Continued

4) Containers for broken glassware and chemical waste, clearly labeled
5) Deluge shower*
6) Emergency exhaust fan separate from the regular air system*
7) Emergency lighting
8) Eye wash station*
9) Fire blanket*
10) First aid kit - use as a source of bandages, remove medications.
11) Ground fault interrupter circuit (GFCI) for electrical outlets in proximity of water splash areas*
12) Master electrical cut-off switch, readily accessible and clearly labeled *
13) Master gas cut-off switch, readily accessible and clearly labeled*
14) Signs clearly marking all safety equipment, hazardous areas and fire exits*

The following equipment should be available to the teacher at least as a department set:

1) Broom and dust pan
2) Sanitizing cabinet for goggles
3) Fume hood with a spark proof motor
4) Demonstration safety shield

*** These items are based on State Board Regulations**

40.3.6 Field Studies/Trips

Careful planning is required before a field trip in order to maximize the use of time and to assure the safety of the students. The School District has policies governing means of transportation, parental permission forms, licensing of drivers, chaperones, collection of student money and accident reporting procedures. These procedures and forms are available at each school and must be followed and/or used.

Section 40: Science Education Safety

40.3 Laboratory Safety - Continued

40.3.6 Field Studies/Trips - Continued

Field trips may involve taking students to natural areas. The following actions are suggested:

1) Notify the school administration of the nature of the trip in advance.
2) Submit the appropriate field trip approval form, student/parent agreement, and/or bus requisition.
3) If at all possible, the teacher should visit the area prior to taking the entire class. Obvious hazards should be noted, such as poisonous plants, dangerous reptiles and other invertebrates, unsafe water, strong currents, electrical hazards and unsafe areas for walking.
4) The teacher should inform the students of any special hazards present at the field trip site and establish required rules for safe conduct.
5) Students should be advised of the appropriate clothing to be worn.
6) The limits of the study area must be clearly defined by the teacher. Students should be informed of a prearranged signal, such as a blast on a whistle that will indicate that they are to return to a certain location.
7) The buddy system should be used to help the teacher keep track of all students. The students must not be allowed to wander off alone.
8) The trip leader must follow school policy regarding first aid. The teacher must check the parental permission forms to assure that any unusual health problems, such as allergies, have been noted and that any required emergency procedures have been anticipated. Students should be instructed to report any injury, no matter how slight, to the teacher at once.
9) A first aid kit is a necessity when visiting a natural area. The kit should be checked and restocked prior to the trip.
10) Cloth, plastic bags or plastic jars should be used for collecting plant and animal specimens. Breakable containers should not be used because of hazards associated with breakage.
11) Students should be taught to recognize and avoid poisonous plants and animals in the field trip area. They should not touch any specimen that they cannot positively identify as being safe.
12) Students with cuts, scratches or open sores should be cautioned about increased risk of infection from water or soil.
13) Most accidents occur as the result of student horseplay and/or carelessness, rather than of willful disregard for safety procedures. By being observant, attentive, and alert to what the students are doing, and by dealing with misbehavior as soon as it occurs, the teacher will minimize many of the risks of field study.

Section 40: Science Education Safety

40.4 Live Organisms

40.4.1 Animals

- **Guidelines for Animals in the Classroom**

Experiences with live animals in the classroom can provide excellent learning opportunities and encourage respect for life. Teachers should be aware of student allergies and not keep animals that cause problems for sensitive students.

The decision to keep live animals in the classroom requires compliance with Florida laws, Florida Game and Fresh Water Fish Commission rules and The School Board of Brevard County policies.

Some of the regulations from these agencies are summarized below:

1) Protected animals (such as indigo snakes, gopher tortoises, alligators and American crocodiles) may not be kept.
2) No more than two box turtles and/or one Florida pine snake may be kept.
3) Venomous animals may not be kept.
4) These animals may be kept without a permit:
   - √ Reptiles (except protected species)
   - √ Gerbils, rats, mice, rabbits, guinea pigs, and hamsters
   - √ Amphibians
   - √ Parakeets, canaries, love birds, cockatiels, finches, myna birds, doves (ringed, ruddy and diamond), button quail
5) All aspects of animal care and treatment shall be supervised by a qualified adult who is knowledgeable about research methods, biology, care and husbandry of the species being studied.
6) Animals must be housed in clean, ventilated, comfortable environments appropriate for the species. Animals must have adequate lighting, humidity and controlled temperature. (See Housing Requirements for Common Classroom animals in Appendix A-7.)
7) Proper care for the animals must be provided at all times, including weekends, holidays and vacation periods.
8) Behavior studies should use only reward (such as providing food) and not punishment in training programs. When food is used as a reward, it should not be withheld for more than 12 hours.
9) The feeding of live vertebrate animals to reptiles should not be viewed by students.
10) Adequate plans should be made to control unwanted breeding of classroom animals.

Section 40: Science Education Safety

40.4 Live Organisms - Continued

40.4.1 Animals - Continued

- **Guidelines for Animals in the Classroom - Continued**

11) Appropriate plans should be made for future care of animals at the conclusion of the study. As a general rule, laboratory-bred animals should not be released into the wild as they may disturb the natural ecology of the environment.
12) Animals should be ordered from reputable suppliers when they are to be used in class experiments to minimize the risk of parasites and diseases. Only those animals that appear to be healthy should be kept in the classroom. Should an animal show any signs of illness, it should be isolated from the other animals.
13) Pregnant or nursing animals should not be handled or disturbed. Even the tamest laboratory animal may inflict a painful bite.
14) The wearing of heavy gloves is recommended when handling animals that may become excited, such as untamed rodents or new additions to a cage.
15) A student bitten by an animal should be attended to in accordance with school procedures and sent to the school clinic with an accident report. The animal must not be destroyed, but should be kept isolated until any required examination is performed.
16) Dried wing scales and exoskeletons from insect collections, mammalian hair and dander and toxic secretions of many animals have all been implicated as allergens.
17) If animals of suspect origin are handled, protective gloves must be worn.
18) After handling any animal, hands should be thoroughly washed.

- **Injured Animals and the Science Teacher**

Wild mammals and birds, whether healthy or injured, brought in by students should not be accepted by the teacher for classroom housing. However, students continue to bring sick or injured animals to the science teacher with the expectation of humane and knowledgeable help. Educators may encourage respect and concern for the well-being of animals by offering assistance, but must protect students from potential hazards such as disease transmission or infections from bites. The injured animal should be isolated until it can be transferred to a licensed rehabilitator.

The Florida Game and Fresh Water Fish Commission regulates licensed rehabilitators for the care and rehabilitation of injured animals and prohibits the possession of sick or injured wildlife by unlicensed persons. Contact Animal Control for assistance in locating a licensed rehabilitator. Animal Control Dispatch's phone number is 633-1765.

Section 40: Science Education Safety

40.4 Live Organisms - Continued

40.4.2 Plants

Plants provide us with food, furnish us with oxygen, beautify our surroundings, and produce some of the most deadly substances to which humans can be exposed. Over 700 poisonous species and thousands of toxic plant principles have been identified. Since it is not possible to list each one, and since all plants have not been researched for their toxicity, the following general rules should be followed:

- Never eat unknown berries, seeds, fruits, or any other plant part.
- Never rub any sap or plant juice into the skin, eyes, or open wound.
- Never inhale or expose the skin or eyes to the smoke of any burning plant or plant parts.
- Never eat food after handling plants without first washing the hands.

Any part or an unknown plant may be toxic. Conversely, simply because a plant is known does not mean that it is safe. Many of Florida's commonly grown ornamental plants are highly dangerous when ingested. Seeds of common garden fruits and vegetables purchased for planting are generally not fit for human consumption. Often they have been treated with hormones, fungicides, and insecticides, and their ingestion may produce allergic reactions, digestive upset, or death.

The list of dangerous plants that follows is far from complete. All of the plants named below are found growing in Florida, and all are toxic to some degree. Teachers should familiarize themselves with the many pamphlets published by the Florida Division of Forestry, the University of Florida, and county agricultural services for more extensive surveys. Be aware that some plants that are recommended for butterfly gardens, such as lantana, are toxic. Take all precautions to protect students from harm.

- **Allamanda**: Ingestion of any part may be hazardous. The sap may cause a rash.
- **Azalea**: Ingestion of any part may produce digestive upset, difficulty in breathing and eventual coma.
- **Balsam Pear**: Ingestion of seeds causes vomiting and diarrhea.
- **Brazilian Pepper:** Allergic reactions may occur after contact with any part of the plant.
- **Castor Bean**: One or two seeds may approach the lethal dose for an adult.
- **Cherry Trees**: Ingestion of bark, or chewing on twigs or leaves, may result in difficulty in breathing, coma and death.
- **China Berry:** All parts of the plant are toxic and can cause paralysis.

Section 40: Science Education Safety

40.4 Live Organisms - Continued

40.4.2 Plants - Continued

Dangerous Plants - Continued

- **Dieffenbachia:** (Also called Dumb Cane) Is an intense irritant of the mouth. Ingestion of any part of the plant may be fatal.
- **Elderberry**: Ingestion of the shoots, leaves, or bark may lead to nausea and digestive upset.
- **Holly:** Ingestion of the berries may lead to nausea, vomiting, diarrhea and stupor.
- **Iris:** Ingestion of the underground stem causes severe, but rarely fatal digestive upset.
- **Jimson Weed**: (Also called Thornapple) All parts are toxic, and ingestion of any part can be fatal.
- **Lantana:** Ingestion of the berries can be fatal.
- **Melaleuca:** Allergic reactions may occur after contact with any part of the plant.
- **Milkweed:** Contact with the sap may cause skin irritation. Ingestion of any plant part can be fatal.
- **Mistletoe:** Ingestion of the berries can be fatal.
- **Mushrooms:** All mushrooms should be considered poisonous in the absence of a positive identification. The differences between edible and poisonous mushrooms should only be learned directly from an expert. Although mushrooms are not plants, they are included here because of their potential toxicity.
- **Nightshade:** Ingestion of the leaves or berries can lead to severe digestive upset, nervous system failure and death.
- **Oak**: Ingestion of leaves or acorns can have an effect on kidney function.
- **Oleander:** Ingestion of leaves and branches may lead to severe digestive upset, circulatory collapse and death. Avoid smoke from burning plants.
- **Poinsettia:** The sap may cause skin irritation. Ingestion of leaves may cause serious digestive upset.
- **Poison Berry:** The green fruit and leaves are toxic causing headache, vomiting, diarrhea, stomach pains, and convulsions.
- **Poison Ivy:** Poison ivy (poison oak, poison vine, three-leafed vine) and poison sumac all contain toxic chemicals. Severe allergic reactions may occur after contact with any part of the plant.
- **Pokeberry, Pokeweed:** Most parts are toxic and cause severe nausea, vomiting, and convulsions.
- **Rhubarb:** Ingestion of the leaf blades may lead to convulsions and death.
- **Rosary Pea:** Ingestion of a single seed has caused death.
- **Spanish Moss:** While the plant itself poses no threat, it may harbor ticks and mites.

Section 40: Science Education Safety

40.4 Live Organisms - Continued

40.4.2 Plants - Continued

Dangerous Plants – Continued

- **Stinging Nettle:** Not a true nettle but in the poinsettia family. Contact with any part of the plant may produce a severe rash with blistering.
- **Trumpet Vine:** The sap is toxic and possibly fatal if ingested.
- **Water Hemlock:** Ingestion of any part of the plant may be fatal.

Students with known allergies to pollen or spores should not be required to participate in plant-related activities. The teacher should always be alert for any signs of serious illness: constriction of the pupils, increase in nasal and salivary secretions, sweating, gastrointestinal distress, tightness in the chest with difficulty in breathing, muscle tremors, itching and swelling of the skin, redness of the eyes and bluish discoloration of the lips and nails. In the case of contact, the area should be washed, and if skin or eye irritation persists, a physician should be contacted.

40.4.3 Microbes

- **Virulent pathogens should never be used for class study, and special care must be taken to avoid accidental contamination of student and stock cultures.**

1) Treat all microorganisms as if they were pathogenic.
2) Maintain aseptic conditions when using microbiological media.
3) Plastic petri dishes should be used to facilitate disposal.
4) Culture dishes, once inoculated, should be sealed with tape and not reopened. Transfers must be made by experienced students under the supervision of a knowledgeable teacher.
5) All cultures and their containers must be autoclaved before disposal. Plastic dishes should be wrapped in aluminum foil, or an autoclavable bag, and autoclaved before disposal. Plastic dishes should be wrapped in aluminum foil, autoclaved for twenty minutes at 184 kPa (20 psi) and discarded without opening the foil. Alternatively, they may be soaked in concentrated disinfectant and then discarded. Plates may be dried completely and disposed of in trash container.
6) Laboratory surfaces should be cleaned with a disinfectant before and after any microbial procedure.
7) Students and teachers should wear a laboratory apron, coat or other appropriate protective attire to prevent contaminating clothing.
8) There should be no eating or drinking in the microbiology laboratory. Food or drink should never be stored in refrigerators containing laboratory materials.

Section 40: Science Education Safety

40.4 Live Organisms - Continued

40.4.3 Microbes - Continued

9) If bacterial cultures are accidentally spilled, the area should be disinfected with an appropriate germicide (e.g., one percent bleach).
10) Wire inoculating loops and needles must be flamed both before and after use.
11) Solutions should never be pipetted by mouth. A rubber pipette bulb or similar device should be used.
12) Microorganisms are ubiquitous and are easily obtained from the environment. These may be dangerous and dishes should be sealed with tape so that students do not touch the colonies.
13) The teacher should caution students to keep their hands away from the mouth, nose and eyes when doing microbiological work. Washing the hands thoroughly at the end of every laboratory period is important.
14) Inhalation of infectious aerosols is by far the most frequent mode of laboratory infection. Any actions that might result in the generation of an aerosol must be avoided. (e.g., shaking an inoculating loop or agitating media).
15) The following cultures are approved for student use with appropriate adult supervision. (Additional microorganisms may be appropriate for advanced students):
    - √ *Micrococcus luteus* (gram positive - coccus)
    - √ *Staphylococcus epidermidis* (gram positive - coccus)
    - √ *Bacillus cereus* (gram positive - rod)
    - √ *Escherichia coli* (non-enteropathogenic) (gram negative - rod)
    - √ *Spirillum serpens* (gram negative - spirillum)

40.4.4 Human Studies

Experiments on the human organism can be among the most motivating and satisfying of laboratory activities for students. They can also be the most dangerous. It is impossible to be too cautious when planning activities that directly affect the health of the students.

- **Cheek cells**
  Removing cheek epithelial cells for microscopic examination is a standard laboratory exercise with little inherent danger. The teacher must nevertheless caution students not to gouge deeply, but to scrape gently with the blunt end of a toothpick or wooden split. Sharp instruments, such as dissecting needles, should never be used. The toothpick or splint should be broken in half to identify it as used and then discarded immediately in an appropriate container.

Section 40: Science Education Safety

40.4 Live Organisms - Continued

40.4.4 Human Studies - Continued

- **Exercise**
  Experiments involving changes in respiratory rate, blood pressure and pulse rate (e.g. running in place, climbing stairs, stepping up on chairs, or other strenuous activities) should be monitored closely by the teacher. No student should be forced to take part in such activities during science class.

- **Genetics**
  In any work involving human genetics, the student's right to privacy must be respected. It is advisable for teachers to have an alternative activity available for students who may be reluctant to divulge family history.

- **Ingestion of Dyes**
  Activities that involve the ingestion of dyes intended to appear later in the student's saliva or in the urine are not acceptable.

- **Spirometers**
  Disposable spirometer mouthpieces should be used and replaced prior to each use. Students should be cautioned to exhale only (NEVER INHALE) when using a spirometer.

- **Tissues and Fluids**
  Laboratory activities involving human blood, fluids. or tissues (except for cheek cells) are not acceptable.

40.5 Dissections

40.5.1 Philosophy

These studies are intended to foster an appreciation for the animal's intrinsic value, its place in the ecosystem and its intricate complexity of form and function. The use of animals in the classroom is sanctioned if the following four criteria have been addressed by the teacher. ***These criteria can be remembered as the Four R's.***

Section 40: Science Education Safety

40.5 Dissections - Continued

40.5.1 Philosophy - Continued

The Four Rs:

- **Respect**
  Teachers should model respect for animals. Discussions on the rationale for animal use and sources of dissection specimens help the student make an informed decision about participation in activities. Taking time to address the proper treatment and careful handling of both live and preserved animals demonstrates respect for the animal.

  Teachers must also respect the diversity of opinion and feelings about the use of animals. Students who object to the dissection of animals should be treated with dignity and given meaningful alternative assignments to accomplish the objectives of the lesson.

- **Refine**
  Refine teaching strategies to ensure that the instruction has a relevant, clearly defined intended outcome.

- **Reduce**
  The number of animals (living or preserved) should be reduced to eliminate unnecessary waste. One significant way to reduce waste is to eliminate the duplication of dissections at different grade levels. In addition, students may be able to work in groups or examine fewer species.

- **Replace**
  Reexamination of traditional dissections in light of currently available strategies may result in a decision to substitute a more relevant and effective activity. Professional journals are also good source of specific and creative laboratory activities.

40.5.2 Safety Guidelines for Dissection

- All laboratory activities include hazards that teachers and students must recognize and avoid.
- During dissection activities, rinse dissection equipment in a disinfectant at least once a day.
- Gloves, goggles and aprons should be worn at all times.

Section 40: Science Education Safety

40.5 Dissections - Continued

40.5.2 Safety Guidelines for Dissection - Continued

- Special care should be taken to prevent bacterial contamination from unpreserved specimens. Unpreserved specimens should be refrigerated and used within 24 hours. All equipment and lab surfaces must be disinfected, and students should be cautioned against touching their faces with contaminated gloves.
- Rules for lab procedures and behavior should be posted and specific precautions should be brought to each student's attention.
- Order preserved specimens from a biological supply house. Specify a delivery date close to the planned date of use in order to reduce exposure. Use only specimens in good condition. Roadkills or fresh specimens of questionable origin are inappropriate.
- Do not use specimens packed in formalin. Soak specimens in water for 24 hours prior to use.
- Rinse specimens before distributing them to the students.
- Dissections should be done in well-ventilated rooms.
- As internal organs are exposed, they should also be rinsed.
- Remains of specimens should be wrapped in paper or placed in plastic bags, then discarded in garbage containers.
- When the dissection is to be carried out over a period of weeks or months, the specimen must be carefully packed away in preservative after each laboratory period. Small specimens should be placed in individual plastic bags and refrigerated overnight if they are to be used a second day.
- When using scissors, cut away from the body whenever possible. Scalpels should be used for incision only; scissors are the tool of choice.
- The most dangerous dissecting tools are those that are dull and therefore require the most force. Only sharp cutting tools should be used.
- If razor blades are used, only the single-edged type with a rigid, reinforced back should be used.
- The hands should be washed thoroughly with soap and water, especially under the fingernails, at the end of the laboratory period.

40.6 Other Science Activities

40.6.1 Dry Ice And Liquid Nitrogen

- The sublimation point of dry ice (solid carbon dioxide) is -78.5^{o}C (-178^{o} F) and the boiling point of liquid nitrogen is -195.5^{o}C (-384^{o} F). Proper insulating gloves, eye protection, and protective clothing MUST be worn when handling these substances. NEVER handle extremely low-temperature substances with bare hands.

Section 40: Science Education Safety

40.6 Other Science Activities - Continued

40.6.1 Dry Ice And Liquid Nitrogen - Continued

- Always store (only temporary storage is possible in school laboratories) dry ice and liquid nitrogen in well-insulated, vented containers such as Dewar Flasks. NEVER place dry ice or liquid nitrogen in a sealed container since the resulting increase in gas pressure may cause an explosion.
- Always transport dry ice and liquid nitrogen in well-vented vehicles. There is a potential danger of asphyxiation due to the displacement of oxygen by nitrogen and carbon dioxide in an enclosed area.

40.6.2 Radioactive Materials

- The State of Florida Department of Health and Rehabilitative Services has approved the possession of small quantities of low yield radioisotopes for educational purposes.

- Radioactive sources used in Brevard classrooms must be limited to alpha and beta emitters that contain 1 microcurie of activity or less.

- Radioactive sources must be encapsulated in labeled discs that are sealed and packaged in their own individual plastic containers.

- Radioactive sources must be secured in the chemical storage room when not in use.

- Information concerning radiation safety, accidents, and disposal of radioactive materials is available from:

Florida Department of Health and Rehabilitative Services
Office of Radiation Control
1323 Winewood Boulevard
Tallahassee, Florida 32301
Phone:(904) 487-1004

40.6.3 Rocketry

- The use of model rockets requires a consideration of safety in several areas: construction, engines, flying conditions, launch, and recovery. Construction of the rocket should be of lightweight, non-metal materials. Follow all instructions exactly and secure all joints carefully with glue.

Section 40: Science Education Safety

40.6 Other Science Activities - Continued

40.6.3 Rocketry - Continued

- The rocket should be tested for stability before flight; the swing test may be used. To conduct a swing test, place a new engine in the rocket and tie a string around the middle of the rocket so that it is balanced. Swing the rocket in circles overhead. If the rocket goes around nose first, it is ready to fly. If it does not, then it is not stable and is not safe to fly.

- Use pre-loaded factory made model rocket engines as recommended by the manufacturer. Never use damaged or modified engines. To dispose of an unused engine, soak it in water until the engine disintegrates. For the first flight, use the smallest engine recommended by the manufacturer. Use only engines that will allow the rocket to land within the recovery area.

- Flying conditions must be considered so as to avoid a launch that could be dangerous to people or property. Do not launch in high winds, near buildings, power lines, tall trees or low flying aircraft.

- The launch area should be cleared and free of flammable materials. The launch pad should have a launch rod at least 3 feet long and a blast deflector to prevent the engine exhaust from starting a fire. There should be an electrical launching system with a cord that will reach at least 15 feet so that no one will be within 15 feet of the launch pad when the rocket is ignited. Have students wear safety goggles during launch.

- Designate a recovery crew to retrieve the rockets. The recovery crew should be equipped with heat-resistant gloves. The crew should also be familiar with all of the safety rules and know the proper way to handle a rocket when returning it to the launch area.

- The use of air or water rockets also requires care to assure that people and property are protected from dangers inherent to projectiles.

40.6.4 Rocks and Minerals

There are several safety guidelines that are related to geology and the earth sciences.

- **Carbonate Tests**
  Use a maximum 2% hydrochloric acid solution.

- **Cleavage Tests**
  Eye protection should be used when performing cleavage or fracture tests on rock or mineral samples. Small fragments can be injurious to the unprotected eye.

Section 40: Science Education Safety

40.6 Other Science Activities - Continued

40.6.4 Rocks and Minerals - Continued

- **Crystal-Growing Kits**
  Be sure that all chemicals in the kits are on the District *Approved Chemicals List*. Most crystal growing kits contain highly toxic and corrosive chemicals. Water-based crystal growing kits-using salts or sugar-are recommended for elementary school students.

- **Fossil Molds**
  Use caution with Plaster of Paris when making casts and molds. Students should avoid inhaling the powder.

- **Hardness Tests/Scratch Tests**
  Be sure that the glass slides are on a hard flat surface and that only minimal pressure is applied when conducting the tests. Have students exercise caution when using nails to conduct scratch tests.

- **Peels of Plant Fossils**
  Use caution with acetone.

- **Rock and Mineral Sample Kits**
  Many older kits contain samples that have asbestos. Those rocks and minerals should be removed from kits. Talc and soapstone are hazardous in powdered form, but are permitted in kits if they are in solid, non-powdered form. Serpentine and hematite samples should not be present in the classroom.

- **Streak Tests**
  Avoid testing talc and soapstone. Hazardous powder is produced when testing these minerals.

40.6.5 Solar Studies

- Students should never look directly at the sun during a solar eclipse or when doing astronomical or spectrographic studies.

- When making observations through a spectroscope, telescopes or pin hole camera, students should use indirect or projection methods

Section 40: Science Education Safety

40.7 Chemical Storage and Handling

40.7.1 Chemical Labels

- **Chemical Labels**

The label on a stock chemical is one of the most valuable sources of information. Typically, a stock chemical label will supply the following information

1) Name of the chemical
2) Chemical formula
3) Degree of hazard
4) Health and physical hazards
5) Precautionary measure to prevent misuse
6) First aid information
7) Many of the chemical companies are also including the NFPA hazard symbol and suggested storage on the label.

The degree of hazard is indicated by the use of appropriate signal words, which call attention to the severity of the potential hazard of the chemical. The major signal words are:

Danger - High degree of hazard
Warning - Intermediate degree of hazard
Caution - Lowest degree of hazard

- **Classes of Hazards**

Exposure to chemical substances can be hazardous to health. The Occupational Safety and Health Administration (OSHA) has defined seven classes of **health hazards:**

1) **Carcinogens (Car) -** Substances that are suspected or proven to produce cancer in humans or laboratory animals.

2) **Corrosives (Cor) -** Substances that cause irreversible damage to skin or eyes at the site of contact.

3) **Highly or Acutely Toxic (ATX) -** Substances that cause death or severe injury when absorbed through the skin, inhaled or ingested in very small doses. The lethal dose of highly or acutely toxic substances is less than 50 milligrams per kilogram of body weight.

4) **Irritants (Ir) -** Substances that are not corrosive in nature, but cause a visible inflammation to human tissue at the site of contact. Irritants normally affect the skin, eyes, nose, mouth and respiratory system.

Section 40: Science Education Safety

40.7 Chemical Storage and Handling - Continued

40.7.1 Chemical Labels - Continued

- **Classes of Hazards - Continued**

5) **Sensitizers (Sn) -** Substances that cause allergic reactions upon repeated exposure.

6) **Target Organ Effecters (TOE) -** Substances that when absorbed into the body cause damage to selected body organs (e.g. brain, heart, kidney, liver).

7) **Toxic (Tx)** - Substances that cause death or severe injury if absorbed through the skin, inhaled or ingested in concentrations between 50 and 5000 milligrams per kilogram of body weight.

In addition to health hazards, many chemicals are physically hazardous. The **physical hazards** are:

1) **Corrosives (Cor) -** Materials such as acids, bases and oxidizers that vigorously attack metals or other materials on contact.

2) **Explosives (Ex) -** Materials that detonate or explode when subjected to heat, sudden shock or friction.

3) **Flammables (Fla) -** Materials that will readily burn if subjected to heat, sparks, flame or other sources of ignition.

4) **Reactives (Rea) -** Materials that produce a chemical reaction or react violently when exposed to air, water or other materials. Chemical reactions are capable of producing heat, fire or explosion.

- **NFPA Labels**

The National Fire Protection Association (NFPA) has established a labeling system that provides a quick and simple method of identifying the type and relative degree of chemical hazard. This system allows individuals who are not familiar with the hazardous nature of chemicals a ready method of identification. The NFPA label includes a diamond-shaped symbol and must be placed on every stock bottle once it is received by the Science Department.

Section 40: Science Education Safety

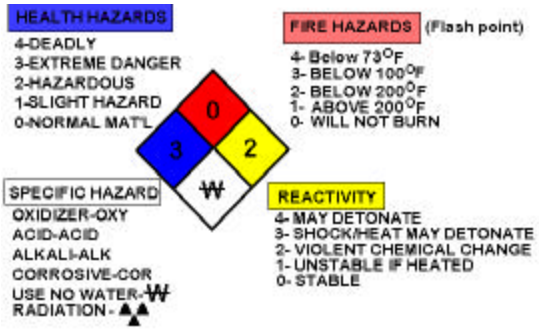
40.7 Chemical Storage and Handling - Continued

40.7.1 Chemical Labels - Continued

NFPA LABEL

- **NFPA Labels - Continued**

The label is divided into four color-coded areas (Health, Fire, Reactivity, and Special) that represent major areas of hazard. The degree of hazard in each area is represented by numbers (0 - none, 1 - minor, 2 - moderate, 3 - severe, 4 extreme). The Special Hazards area is reserved for symbols that represent special handling and storage precautions that need to be observed.



40.7.2 Material Safety Data Sheet

The Material Safety Data Sheet (MSDS) is designed to provide the teacher with guidelines concerning the proper handling and safe use of substances. The format and information provided by a MSDS may vary depending on the source but usually includes the following data:

1) Melting point
2) Boiling point
3) Density
4) Specific gravity
5) Flash point
6) Viscosity
7) Vapor pressure
8) Appearance
9) Odor
10) Toxicity
11) Health
12) Fire
13) Reactivity hazards
14) Proper storage
15) Spill/leak cleanup
16) Disposal procedures
17) Protective equipment

Section 40: Science Education Safety

40.7 Chemical Storage and Handling - Continued

40.7.2 Material Safety Data Sheet - Continued

It is important to become familiar with the chemical name and its various synonyms since different sources (vendors, chemical container labels, text and lab books, reference and safety manuals, and emergency personnel) may use different names for the same chemical. The chemical may also be referred to by its formula.

A review of certain key sections on an MSDS will usually give a teacher a good understanding of the potential danger and risks involved with using the substance in the science classroom.

- **DOT Class** - This is a classification of the substance by the Department of Transportation (DOT). DOT classifications may include terms such as oxidizer, toxin, flammable substance, irritant, and corrosive.

- **Reactivity** - This section indicates whether a product is stable if stored and handled properly. Substances that are identified as unstable may react when exposed to normal conditions such as air, humidity, low temperatures, and slight to moderate physical shock. Unstable substances are therefore more dangerous to work with and more difficult to store.

- **Conditions to Avoid** - This section can be very helpful to the teacher as a source for planning the safe use of the chemical substance. For example, this section advises that methanol be secured from any ignition source. Thus the teacher now knows that sources of heat and electrical sparks must be either eliminated or controlled before the use of this chemical in the classroom or laboratory.

- **Heath Hazard** - This section offers critical information including how the chemical can enter your body (inhalation, swallowing, skin absorption) and what health hazards could result from the exposure. Substances which are absorbed through the skin and which may result in acute symptoms are generally more dangerous to use due to the risk of accidental exposure.

- **Fire Hazard -** This section describes the flammability of the substance. For example, methanol has a flash point of 54 degrees Fahrenheit. The flash point is the lowest temperature at which a combustible liquid will generate a flammable vapor. Since the flash point is well below average classroom temperature, the teacher knows that potentially dangerous vapors will be given off when this substance is being used. This section also recommends the type of fire extinguisher to use if the substance ignites.

Section 40: Science Education Safety

40.7 Chemical Storage and Handling - Continued

40.7.2 Material Safety Data Sheet - Continued

- **Threshold or Tolerance Limit Value (TLV) -** Developed by the American Conference of Governmental Industrial Hygienists, this section describes the maximum chemical concentration allowed for a person who is exposed to a particular chemical on a daily basis. No one should be exposed to a level above the TLV for any amount of time. It is important to keep in mind that TLVs were originally created as general guidelines for industrial workers and do not represent absolute limits. TLVs are updated as new data is developed. In most cases, students will not be exposed to a chemical on a daily basis. The teacher may incur more significant exposure time at higher concentrations than the students. TLVs may be expressed in different units depending on the physical form of the substance. For particular matter such as dust or fine mist, concentrations are expressed in units of milligrams per cubic meter. For gases and vapors given off by volatile substances such as methanol, concentrations are usually reported as parts per million in air (ppm). Another useful measure of toxicity often reported on the MSDS is the research based LD_{50} value. LD means Lethal Dose. The subscript 50 indicates that 50% of the test animals (usually rats) died when administered the lethal dosage. For example, the LD_{50} for potassium cyanide is 10 mg/kg of body mass. Therefore 50% of the test animals died when administered a dosage of 10 mg/kg of potassium cyanide. By contrast the LD_{50} for mercuric chloride is 1 mg/kg, indicating its toxicity to be approximately ten times greater that potassium cyanide. Methanol's LD_{50} is 3180 mg. **The lower the TLV or LD_{50} the more toxic the substance, thus the greater the potential danger in the science classroom environment.**

- **Special Precautions** - This section reinforces the information in the previous sections and advises steps that can be taken to ensure safer use of the substance. For example, the MSDS may recommend that methanol be dispensed in small containers under a fume hood to control the flammable fumes and to reduce the air concentration to a level below the TLV. It also advises the use of proper gloves and goggles to protect the skin and eyes. This section is therefore useful when planning for chemical hygiene practices, which may prevent accidental exposure.

- **First Aid** - This section offers procedures that are structured to diminish the exposure time to a dangerous substance. The teacher and students should know this information before beginning the lab activity.

Section 40: Science Education Safety

40.7 Chemical Storage and Handling - Continued

40.7.2 Material Safety Data Sheet - Continued

- **Spills, Leaks and Disposal** – In this section, recommendations will be made for proper and safe cleanup and disposal of any materials that are accidentally spilled or discharged from their container. Suggestions for appropriate spill response materials may also be indicated.

- **CAS No. -** The teacher can find additional information on a substance by using the Chemical Abstracts Service registry number. Each substance has its own registry number that can be used to find information on that substance when accessing the Chemical Abstracts Service Database.

The MSDS provides both useful and critical information on a substance, which can help to ensure a safe science classroom environment. Awareness of information on the MSDS is essential if chemicals are to be used.

40.7.3 Chemical Storage

Chemicals should be stored according to compatibility on stable shelving with proper ventilation. Science departments can reduce potential hazards in storage by maintaining a small dynamic inventory with limited quantities. This assures fresh supplies and helps to alleviate the problem of disposing of old, out-of-date chemicals. Purchasing disposable and safe laboratory supplies should be a major consideration.

Another consideration in the storage of chemicals is whether the storeroom itself is safe. Fire protection, chemical exposure protection and security are important concerns. The storeroom must have certain safety features, including at least one type ABC dry chemical fire extinguisher, a pail of silica sand and material to neutralize and contain liquid chemical spills (spill control kit). A smoke detector is also recommended.

Teachers should not prepare laboratory materials inside the storeroom because of the hazardous nature of chemical incompatibility. Teachers must also be aware that many chemicals have a limited shelf life. Many chemicals become more or less reactive over time. Teachers should refer to a suitable reference to determine the shelf life of the chemicals in their storeroom.

Section 40: Science Education Safety

40.7 Chemical Storage and Handling - Continued

40.7.3 Chemical Storage - Continued

CHEMICALS MUST NOT RESTORED ALPHABETICALLY. The safest and most efficient storage pattern for chemicals is to separate the chemicals into their organic and inorganic families. Each family is then subdivided into compatible sub-families. Chemicals should be stored according to this pattern.

- **Storage pattern codes:**
  1) **IN** - inorganic chemicals on open shelves.
  2) **OR** - organic chemicals on open shelves.
  3) **AC** - acid cabinet
  4) **FC** - flammable cabinet

- **Keep a current inventory of all chemicals. The inventory should include the following information:**
  1) Chemical name
  2) Chemical formula
  3) Date purchased
  4) Storage pattern code (IN, OR, AC, FC)
  5) Quantity
  6) Hazard
  7) Disposal method
  8) Purchase restrictions (if any)
  9) Other storage considerations:

     The chemical storeroom must be locked at all times.
     Students should not have access to the chemical storeroom.
     An NFPA label *must* be placed on all stock chemicals.
     Prepared chemicals must be appropriately labeled.
     All flammables (materials with an NFPA Flammability Rating 3 or 4) *must* be stored in a dedicated flammables cabinet.
     All inorganic and some organic acids should be stored in a dedicated acid cabinet.
     Isolate concentrated nitric acid from organic acids in an isolation cube or in a styrofoam shipping container. It may be stored on a storeroom shelf near the floor if organic acids are stored in the cabinet.
     Isolate ammonium nitrate in the solid form from all other chemicals.
     Chemicals must never be stored on the floor, even temporarily.
     Chemicals must never be stored on the top of a storage cabinet.
     Chemicals must never be stored above eye level.
     Shelf assemblies must be firmly attached to the wall.
     All shelving must have anti-roll-off one-half inch lips.
     All shelving units should be made of chemically resistant material.
     All chemicals ordered for AP/second year courses/Research are to be labeled "AP/II".

Section 40: Science Education Safety

40.7 Chemical Storage and Handling - Continued

40.7.4 Incompatible Chemicals

A wide variety of chemicals react dangerously when mixed with certain other chemicals. The chemical storage patterns are designed to prevent such occurrences. Some of the more widely used incompatible chemicals are listed below, but the absence of a chemical from this list should not be taken to indicate that it is safe to mix it with any other chemical.

Although many of the chemicals on this list are not on the *Approved Chemical List,* they are listed for reference purposes.

CHEMICAL	INCOMPATIBILITIES
Acetic acid	Chromic acid, nitric acid, hydroxyl compounds, perchloric acid, peroxides, permanganates
Acetone	Concentrated sulfuric and nitric acid
Acetylene	Chlorine, bromine, copper, fluorine, silver, mercury
Alkali and alkaline earth metals (powdered calcium, magnesium, etc.)	Water, chlorinated hydrocarbons, carbon dioxide, halogens, alcohols, aldehydes, ketones, acids
Anhydrous ammonia	Mercury, chlorine, calcium hypochlorite, iodine, bromine, hydrofluoric acid
Ammonium nitrate	Acids, metal powders, flammable liquids, chlorates, nitrates, sulfur, finely divided organic combustible materials
Aniline	Nitric acid, hydrogen peroxide
Arsenic compounds	Reducing agents
Azides	Acids
Bromine	Ammonia acetylene, butadiene, hydrocarbons
Calcium oxide	Water
Carbon (activated)	Calcium hypochlorite, oxidizing agents
Carbon tetrachloride	Sodium
Chlorates	Ammonium salts, acids, metal powders, sulfur, finely divided organic or combustible materials
Chromic Acid and Chromium	Acetic acid, naphthalene, camphor, glycerin, turpentine, benzene, finely divided metals
Chlorine	Ammonia acetylene, butadiene, hydrocarbons, hydrogen, sodium carbide, turpentine, benzene, finely divided metals
Chlorine dioxide	Sulfide ammonia, methane, phosphine, hydrogen

Section 40: Science Education Safety

40.7 Chemical Storage and Handling - Continued

40.7.4 Incompatible Chemicals - Continued

CHEMICAL	INCOMPATIBILITIES
Copper	Acetylene, hydrogen peroxide, nitric acid
Cumene hydroperoxide	Acids, organic or inorganic
Acetylene	Chlorine, bromine, copper, fluorine, silver, mercury
Cyanides	Acids
Flammable liquids	Ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
Hydrocarbons, (butane, benzene, etc.)	Fluorine, chlorine, bromine, chromic acid, sodium peroxide
Hydrocyanic acid	Nitric acid, alkali
Hydrofluoric acid	Aqueous or anhydrous ammonia
Hydrogen peroxide	Copper, chromium, iron, most metals or their salts, acetone, organic materials, aniline, nitromethane, flammable alcohols, liquids, oxidizing gases
Hydrogen sulfide	Fuming nitric acid, oxidizing gases
Hypochlorites	Acids, activated carbon
Iodine	Acetylene, ammonia (aqueous or anhydrous), hydrogen
Mercury	Acetylene, fulminic acid, ammonia
Nitrates	Acids
Nitroparaffins	Inorganic bases, amines
Oxalic acid	Silver, mercury
Oxygen	Oils, greases, hydrogen, flammables
Perchloric acid	Acetic anhydride, bismuth and its alloys, ethanol, paper, wood
Peroxides (organic)	Acids, avoid friction or shock
Phosphorus (white)	Air, alkalies, reducing agents, oxygen
Potassium	Carbon tetrachloride, carbon dioxide, water
Potassium chlorate	Acids
Potassium perchlorate	Acids
Potassium permanganate	Glycerin, ethylene glycol, benzaldehyde, sulfuric acid
Selenides	Reducing agents
Silver	Acetylene, oxalic acid, tartaric acid, ammonium compounds, fulminic acid
Sodium	Carbon tetrachloride, carbon dioxide, water
Sodium nitrite	Ammonium salts
Sodium peroxide	Ethanol, methanol, glacial acetic acid, acetic anhydride, benzaldehyde, carbon disulfide, glycerin, ethylene glycol, ethyl acetate, methyl acetate, furfural
Sulfides	Acids

Section 40: Science Education Safety

40.7 Chemical Storage and Handling - Continued

40.7.4 Incompatible Chemicals - Continued

CHEMICAL	INCOMPATIBILITIES
Sulfuric acid	Potassium chlorate, potassium perchlorate, potassium permanganate (or compounds with similar light metals, such as sodium, lithium, etc.)
Tellurides	Reducing agents
Matter	Antimatter

40.7.5 Chemical Disposal and Spills

In 1976, Congress passed the *Resource Conservation and Recovery Act* (RCRA), which directed the U.S. Environmental Protection Agency (EPA) to develop and implement a program to protect human health and the environment from improper hazardous waste management practices. The program is designed to manage hazardous waste from its generation to its ultimate disposal.

- **Disposal Techniques**

  The *Approved Chemical List* (See the Appendices) contains the information for the appropriate disposal of each chemical. These disposal techniques are to be used only for chemicals used or produced during laboratory experimentation. Large quantities of chemicals of old stock chemicals are to be properly labeled and stored for pickup by a licensed hazardous waste hauler.

- **The Disposal Codes:**

  D - Indicates the material is to be diluted. The dilution must be 100 volumes of water to one volume of chemical.

  P - Pour the material down the drain to a public sanitary sewer system. No chemical may be discharged to a septic tank system.

  T - Wrap the material in paper and dispose of it in the trash can.

  N - Neutralize hazardous properties. (The chemical can be chemically neutralized on school site.)

  SW-1 - *Special Waste 1:* These chemical wastes are to be stored in a closed metal container (approximately 1 gallon capacity), which bears the label "Hazardous Waste Liquid - Satellite Container." At the end of each school semester, or when the container becomes full, pour its contents into the "Waste Paint" storage drum that is located in the school's Flammable Storage Building. (See below)

Section 40: Science Education Safety

40.7 Chemical Storage and Handling - Continued

40.7.5 Chemical Disposal and Spills - Continued

- **Disposal Codes: - Continued**

  SW-2 - *Special Waste 2*: Silver containing wastes are to be stored in a closed plastic container (approximately 1 gallon capacity) which bears the label, "Hazardous Waste - Recoverable Silver Solution - Satellite Container." When the container becomes full, notify the Office of Plant Operations or your school administrator. (See below)

  R - Return to vendor.

40.7.6 Chemical Waste Storage

The following information applies to those chemicals with disposal codes of SW-I and SW-2 on the School Board of Brevard County *Approved Chemical List*.

- **Flammable Waste Organic Solvents (SW-1)**

  √ Store in a common, closed metal container, which has a capacity of one gallon or less. The container must bear the label "Flammable Hazardous Waste - Satellite Container". The lid must be kept tightly closed except when waste is being transferred to or from the container. This container must be secured in the Flammable Storage cabinet at all times when not in use.

  √ At the end of each semester, or when the container becomes full (whichever comes first), the contents of the Flammable Hazardous Waste Container are to be poured into the "Paint Waste" drum which is kept in the Flammable Storage Building at each school. The contents of the "Paint Waste" drum must be removed by a licensed hauler of hazardous waste. The waste hauler will transport the waste to a licensed disposal facility where it will be reclaimed as a fuel product.

- **Waste Silver Containing Solution (SW-2)**

  √ Waste solutions that contain silver are to be stored in a common, closed plastic container, which has a capacity of one gallon or less. The container must bear the label, "Hazardous Waste - Recoverable Silver Solution - Satellite Container." The lid must be kept tightly closed except when waste is being transferred to or from the container. This container is to be kept secured in the chemical storage room.

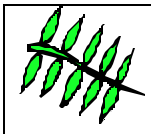
  √ When the container becomes full, notify the Office of Plant Operations or your school administrator.

Section 40: Science Education Safety

40.8 Science Activities- General Safety Rules

The following tables list the safety rules for specific Science Education activities and may be used as a general guideline.

40.8.1 Nature of Matter



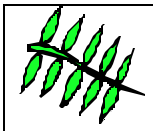
ACTIVITY 1: NATURE OF MATTER

Safety Rule	Appropriate Grade Level
1) Students should never touch, smell or taste any substance unless permitted to do so by the instructor.	Pre K-2 3-5 6-8 9-12
2) Teach students to never place the nose directly over a chemical substance but to keep the chemical at arm's length and "waft" the vapors toward the nose.	Pre K-2 3-5 6-8 9-12
3) Use only test kits that include chemicals that are on the Brevard Public Schools *Approved Chemicals List*. (See Appendices)	3-5 6-8 9-12
4) Read labels on containers before using.	3-5 6-8 9-12
5) Wear appropriate gloves when using potentially hazardous chemicals.	3-5 6-8 9-12
6) Do not return unused chemicals to original containers. Dispose of properly.	3-5 6-8 9-12
7) Store chemicals in an approved storage area.	3-5 6-8 9-12
8) Students should wear eye protection when working with any hazardous chemical.	3-5 6-8 9-12

Section 40: Science Education Safety

40.8 Science Activities- General Safety Rules - Continued

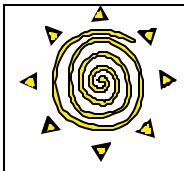
40.8.1 Nature of Matter - Continued



ACTIVITY 1: NATURE OF MATTER – Continued

Safety Rule	Appropriate Grade Level
9) Elementary students must use plastic scissors or plastic knives for cutting. Only the instructor can use Exacto knives or razor blades in an elementary class.	3-5
10) Students must wear goggles anytime liquids or chemicals are mixed or combined.	6-8 9-12
11) Crystal kit ingredients must be on the Brevard Public Schools *Approved Chemical List.* (See Appendices)	6-8 9-12
12) Radioactive sources used in the classroom are limited to those approved by the State of Florida Department of Health and Rehabilitative Services. *	9-12
13) A fume hood must be used when potentially hazardous vapors or gaseous substances are used or produced in laboratory activities.	9-12

40.8.2 Energy



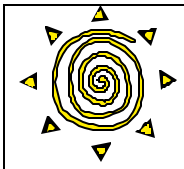
ACTIVITY 2: ENERGY

Safety Rule	Appropriate Grade Level
1) Students should be instructed to never look directly at the sun.	PreK-2 3-5 6-8 9-12

Section 40: Science Education Safety

40.8 Science Activities- General Safety Rules - Continued

40.8.2 Energy - Continued



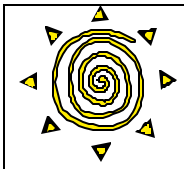
ACTIVITY 2: ENERGY - Continued

Safety Rule	Appropriate Grade Level
2) Do not use mercury thermometers; use those that contain alcohol.	Pre K-2 3-5 6-8 9-12
3) Use regular D cell batteries. Avoid alkaline batteries, which can generate enough heat to cause burns.	PreK-2 3-5
4) Limit the movement of students within a darkened room.	3-5 6-8 9-12
5) Replace glass mirrors with polished metal mirrors or plastic mirrors.	3-5
6) Review proper safety precautions prior to initiating activities that involve the use of batteries or electricity.	3-5 6-8 9-12
7) Use regular dry cell batteries when teaching electrical circuits. (Avoid alkaline batteries)	3-5
8) Use low amperage and low voltage dry cell batteries (12 volt direct current maximum).	3-5
9) Dispose of batteries that are leaking or corroded.	3-5 6-8 9-12
10) Students must wear eye protection anytime a heating agent is used (hot plate, candles, etc.)	3-5 6-8 9-12

Section 40: Science Education Safety

40.8 Science Activities- General Safety Rules - Continued

40.8.2 Energy - Continued



ACTIVITY 2: ENERGY - Continued

Safety Rule	Safety Rule
11) A multipurpose ABC dry chemical fire extinguisher should be available during any activity in which a heating agent is used.	3-5 6-8 9-12
12) Purchase iron filings from an approved supplier.	PreK-2 3-5 6-8 9-12
13) Take precautions to ensure that students do not inhale or ingest iron filings.	Pre K-2 3-5 6-8 9-12
14) Lenses and mirrors must be inspected for chips and cracks.	6-8 9-12
15) The use of lasers, ultraviolet light sources, strobe lights and light sources in general in the classroom requires special precautions.*	6-8 9-12
16) Use special precautions when using electrical devices.*	6-8 9-12
17) Only hot plates designed for laboratory applications should be purchased and used. The heating elements should be fully enclosed. There should be an indicator light showing when the hot plate is on and the power cord should be grounded.	6-8 9-12

Section 40: Science Education Safety

40.8 Science Activities- General Safety Rules - Continued

40.8.3 Force and Motion

ACTIVITY 3: FORCE AND MOTION

Safety Rule	Appropriate Grade Level
1) Purchase iron filings from an approved supplier.	PreK-2 3-5 6-8 9-12
2) Keep iron filings away from fans or windy areas in the classroom.	PreK-2 3-5 6-8 9-12
3) Use caution when using levers or heavy masses/weights.	3-5 6-8 9-12
4) Students should wear eye protection when working with metal springs.	3-5 6-8 9-12
5) The launching of model rockets requires special precautions.*	6-8 9-12

40.8.4 Processes That Shape the Earth

ACTIVITY 4: PROCESSES THAT SHAPE THE EARTH

Safety Rule	Appropriate Grade Level
1) Students should wash hands after handling soil or water samples.	PreK-2 3-5 6-8 9-12

Section 40: Science Education Safety

40.8 Science Activities - General Safety Rules - Continued

40.8.4 Processes That Shape the Earth - Continued

ACTIVITY 4: PROCESSES THAT SHAPE THE EARTH - Continued

Safety Rule	Appropriate Grade Level
2) Students should not inhale dust from soil samples.	PreK-2 3-5 6-8 9-12
3) Instruct students on severe weather precautions.	PreK-2 3-5 6-8 9-12
4) Place porcelain or glass streak plates on flat surfaces when conducting streak or scratch tests.	3-5
5) Wear eye protection when breaking rocks.	3-5 6-8 9-12
6) Samples of asbestos may only be used if they are embedded in plastic.	3-5 6-8 9-12
7) Make sure that rock samples or kits contain only those rocks or minerals that are on the Brevard Public Schools *Approved Chemical List*. (See Appendices)	3-5 6-8 9-12
8) Field studies require special guidelines. *	6-8 9-12

Section 40: Science Education Safety

40.8 Science Activities- General Safety Rules - Continued

40.8.5 Earth and Space

ACTIVITY 5: EARTH AND SPACE

Safety Rule	Appropriate Grade Level
1) Students should never look directly at the sun. For viewing eclipses, use a pinhole camera, or other projection techniques.	PreK-2 3-5 6-8 9-12
2) Do not allow students to look directly at strong light sources (sun, ultraviolet lights, "black" lights, laser pointers).	PreK-2 3-5 6-8 9-12
3) Use only factory-prepared, solid propellant engines when launching model rockets.	3-5 6-8 9-12
4) Students should wear eye protection when launching model rockets.	3-5 6-8 9-12
5) Never launch model rockets in high winds, near buildings or tall trees, around low-flying aircraft, or under any conditions that would endanger people or property.	3-5 6-8 9-12

40.8.6 Processes of Life

ACTIVITY 6: PROCESSES OF LIFE

Safety Rule	Appropriate Grade Level
1) Live vertebrates for activities other than observational studies are not appropriate for elementary students.	PreK-2

Section 40: Science Education Safety

40.8 Science Activities - General Safety Rules - Continued

40.8.6 Processes of Life – Continued

ACTIVITY 6: PROCESSES OF LIFE - Continued

Safety Rule	Appropriate Grade Level
2) Students should not handle reptiles. Many carry *Salmonella*.	PreK-2 3-5 6-8 9-12
3) Some butterfly gardens contain plants that are toxic. Ingestion of Lantana berries, for example, can be fatal.	PreK-2 3-5 6-8 9-12
4) Wash hands after handling animals and plants.	PreK-2 3-5 6-8 9-12
5) Use appropriate heavy gloves when handling animals that could bite or scratch.	PreK-2 3-5 6-8 9-12
6) Discourage students from bringing personal pets to school. If they are brought into the classroom, only their owners should handle them.	PreK-2
7) Handle animals with care and respect.	PreK-2 3-5 6-8 9-12
8) The study of animals, plants, microbes and humans requires special precautions. *	PreK-2 3-5 6-8 9-12
9) Animal hair, scales, and waste can cause allergic reactions in some students.	PreK-2 3-5 6-8 9-12

Section 40: Science Education Safety

40.8 Science Activities- General Safety Rules - Continued

40.8.6 Processes of Life – Continued

ACTIVITY 6: PROCESSES OF LIFE - Continued

Safety Rule	Appropriate Grade Level
10) Incubators should have properly working thermostats and heating elements.	PreK-2 3-5 6-8 9-12
11) Aquaria should be free of cracks, chips, and leaks. They should be set up on stable, strong furniture away from student traffic. Electrical accessories should be free of defects and plugged into a ground-fault circuit interrupter (GFCI) outlet. Students should be cautioned about the potential for electric shock.	PreK-2 3-5 6-8 9-12
12) Use fertilizers in low concentration forms such as liquid solutions or slow release pellets or sticks.	3-5
13) Store plant food/fertilizer secure from students and away from oxidizers (bleach).	3-5 6-8 9-12
14) Do not use fungicides or insecticides. Professional pest control personnel should perform pest treatments.	3-5 6-8 9-12
15) Alert students of the types and locations of poisonous plants prior to field work.	3-5 6-8 9-12
16) Use commercially prepared slides for examinations of human tissue.	3-5 6-8 9-1
17) Monitor students when conducting activities designed to increase the heart rate.	3-5 6-8 9-12
18) Algae should be ordered from a biological supply company.	3-5 6-8 9-12

Section 40: Science Education Safety

40.8 Science Activities- General Safety Rules - Continued

40.8.6 Processes of Life – Continued

ACTIVITY 6: PROCESSES OF LIFE - Continued

Safety Rule	Appropriate Grade Level
19) The use of animals in the classroom requires special precautions. *	6-8 9-12
20) Order preserved specimens from an appropriate supplier.	9-12
21) The use of incubators require special precautions. *	9-12
22) The use of centrifuges requires special precautions. *	9-12
23) Blood simulation kits should be used instead of human blood.	9-12
24) Biological substances require special care and handling. *	9-12

40.8.7 How Living Things Interact With the Environment

ACTIVITY 7: HOW LIVING THINGS INTERACT WITH THE ENVIRONMENT

Safety Rule	Appropriate Grade Level
1) Alert students about toxic plants in the local environment.	PreK-2
2) Students should not bring in plant specimens from ponds, ditches, canals, etc. Algae cultures should be purchased from a reputable supplier to avoid microorganisms that may cause disease.	PreK-2 3-5 6-8

Section 40: Science Education Safety

40.8 Science Activities- General Safety Rules - Continued

40.8.7 How Living Things Interact With the Environment - Continued

ACTIVITY 7: HOW LIVING THINGS INTERACT WITH THE ENVIRONMENT - Continued

Safety Rule	Appropriate Grade Level
3) Some butterfly gardens contain plants that are toxic.	PreK-2 3-5 6-8
4) Live vertebrates for activities other than observational studies are not appropriate for elementary students.	PreK-2 3-5
5) Students should not handle reptiles. Many carry *Salmonella*.	3-5 6-8
6) Wash hands after handling plants and animals	3-5 6-8 9-12
7) Use appropriate heavy gloves when handling animals that could bite or scratch.	3-5 6-8 9-12
8) Discourage students from bringing personal pets to school. If they are brought into the classroom, only their owners should handle them.	3-5
9) Handle animals with care and respect.	3-5 6-8 9-12
10) The study of animals, plants, microbes, and humans requires special precautions.*	3-5 6-8 9-12
11) Aquaria should be free of cracks, chips, and leaks. They should be set up on stable, strong furniture away from student traffic. Electrical accessories should be free of defects and plugged into a ground-fault circuit interrupter (GFCI) outlet. Students should be cautioned about the potential for electric shock.	PreK-2 3-5 6-8 9-12

Section 40: Science Education Safety

40.8 Science Activities- General Safety Rules - Continued

40.8.8 Nature of Science

ACTIVITY 8: NATURE OF SCIENCE

Safety Rule	Appropriate Grade Level
1) Animal hair, scales, and waste can cause allergic reactions in some students.	PreK-2 3-5 6-8
2) Incubators should have properly working thermostats and heating elements.	3-5 6-8 9-12
3) Microscope eyepieces should be regularly sanitized with an alcohol-bases lens cleaner.	3-5 6-8 9-12
4) Microscope mirrors should never be aimed directly at the sun.	3-5 6-8 9-12
5) Fertilizers and plant food should be handled with caution since they may contain corrosive oxidizers such as nitrates. The items should not be stored in metallic containers.	3-5 6-8 9-12
6) The use of animals in the classroom requires special precautions.*	6-8 9-12
7) Microbiological activities require special precautions.*	9-12
8) Students must use eye protection whenever a heating element is used or when mixing potentially hazardous chemicals.	PreK-2 3-5 6-8 9-12
9) Thermometers that use mercury should not be used.	PreK-2 3-5 6-8 9-12
10) Hot plates with enclosed coils are the recommended source of heat.	PreK-2 3-5 6-8 9-12

Section 40: Science Education Safety

40.8 Science Activities- General Safety Rules - Continued

40.8.8 Nature of Science - Continued

ACTIVITY 8: NATURE OF SCIENCE - Continued

	Appropriate Grade Level
11) Candles placed in pie tins filled with sand may be used if hot plates are not available.	PreK-2 3-5 6-8 9-12
12) Canned heat (Sterno) may be used for teacher demonstrations.	3-5
13) The use of alcohol burners is strongly discouraged.	3-5
14) Store masses/weights below eye level in a secure area.	3-5
15) Students should wear closed-toe shoes to reduce the risk of foot injury.	PreK-2 3-5 6-8 9-12
16) Plastic or polypropylene containers (graduated cylinders, beakers) are preferred over glass containers. If glass graduated cylinders are used, they should have plastic safety rings in place near the top lip of the container.	3-5
17) If glassware is used, Pyres, Kimax, or other tempered glassware is preferred.	PreK-2 3-5 6-8 9-12
18) If materials are being heated in a test tube, the test tube mouth should be pointed away from people.	PreK-2 3-5 6-8 9-12

Section 40: Science Education Safety

40.8 Science Activities- General Safety Rules - Continued

40.8.8 Nature of Science - Continued

ACTIVITY 8: NATURE OF SCIENCE - Continued

Safety Rule	Appropriate Grade Level
19) Cleaning agents (detergents, soaps, chalkboard cleaners, glass cleaners, polishes, bleaches, ammonia, etc.) must be used and stored with caution. The use of these substances by students should be monitored closely, since they pose potential hazards to students who may allergic to them. Do not mix cleaning agents, since some chemicals may react with others to produce highly toxic fumes. For example, if any cleaner that contains chlorine (Comet) is mixed with any containing ammonia (Windex) chlorine gas is produced.	3-5 6-8 9-12
20) Use caution when using volatile (evaporates quickly at room temperature) and flammable substances.	3-5 6-8 9-12
21) Extreme caution must be observed when using any substance in powder or dust form. The hazards associated with dusts and powders include, fire, explosion, toxicity, and allergic reactions. Examples of substances, which require precautions, are chalk, charcoal, pastels, Plaster of Paris, cornstarch and cooking flour.	3-5 6-8 9-12
22) Always read the hazard cautions on product labels.	3-5 6-8 9-12
23) Foods for human consumption should never be kept in laboratory refrigerators.	6-8 9-12
24) Flammable solvents should not be kept in a refrigerator unless it is specifically designed to be “explosion-proof”.	6-8 9-12

Section 41: Signs, Tags and Hazard Warnings

41.1 Introduction

Safety signs and tags are used throughout School Board of Brevard County facilities to identify potentially hazardous situations in order to increase awareness and prevent accidents and injuries. The following information specifies the requirements of the Occupational Safety and Health Administration's requirements for signs and tags so that the messages they convey will be understandable and appropriate preventative actions can be taken.

29 CFR 1910.144 **29 CFR 1910.145**

41.2 Signs

41.2.1 General Rules for Signs

- **Signs Must**:
  - Have rounded or blunt corners;
  - Be free from sharp edges, splinters or sharp projections;
  - Not have ends or bolts or other fastening devices that create a hazard;
  - Have wording that is concise and easily read;
  - Have a positive, not negative message.

41.2.2 Types of Signs

1) ***Danger Sign*** - Identifies something as very high risk. Indicates immediate danger and specifies that you must take special precautions in order to prevent a serious accident, injury or death.

   - The word "Danger" always appears in white letters in a red oval on a black background. The information will appear in black letters on a white background, below the word DANGER on the sign.

2) ***Warning Sign*** - Identifies something as potentially high risk. Indicates potential for danger and specifies that you must take special precautions in order to prevent a potentially serious accident, injury or death.

   - Warning appears in black letters on an orange background. The information will appear in black letters below the word WARNING on the sign

3) ***Caution Sign*** - Indicates potential hazards, requires caution or reinforces the need for safe work practices.

   - The word "Caution" always appears in yellow letters against a black background. Information will appear in black letters against a yellow background, below the word CAUTION on the sign.

41.2.2 Types of Signs - Continued

4) ***Safety Instruction Sign*** - Delivers safety instructions or suggestions.

   – The message appears in white letters against a green background. Any further information will appear in black letters on a white background.

5) ***Biological Hazard Sign*** - signifies or identifies the presence of a biohazard or infectious agent that presents a potential risk to the worker's health.

   – The message must include the words "Biohazard" or "Biological Hazard" along with the biohazard symbol.

6) ***Slow-Moving Vehicle Emblem*** - used on vehicles which move slowly (25 mph or less) on public roads.

   – Sign consists of a fluorescent yellow-orange triangle with a dark red reflective border.

41.3 Safety Tags

41.3.1 General Rules for Tags

- **Tags Must**:
  - Contain a signal word and a major message;
  - Use either "Danger", "Caution", "Warning", "Biological Hazard" or the biohazard symbol as the signal word;
  - Have signal words large enough to be read at a minimum distance of 5 feet;
  - Have a major message that indicates the specific hazardous condition or safety instruction; For example: *"High Voltage", "Do Not Start", etc.*
  - Be understandable;
  - Be affixed as close as possible to the hazard with a positive means such as string, wire or adhesive.
- Tags may also use pictographs to identify a hazardous condition or convey a safety message.
- Tags are to be used until the identified hazard is eliminated or the hazardous operation is completed. **ONLY AUTHORIZED EMPLOYEES MAY REMOVE TAGS!**

41.3.2 Types of Tags

1) ***Danger Tags*** - must be used in major hazard situations where immediate hazard of death or serious injury is present. **DANGER TAGS MAY ONLY BE USED IN THESE SITUATIONS.**
2) ***Caution Tags*** - must be used in minor hazard situations where hazards present a lesser threat of employee injury due to a non-immediate or potential hazard or unsafe practice.

3) ***Warning Tags*** - may be used to represent a hazard level between "Caution" and "Danger", or instead of the "Caution" tag.
4) ***Biological Hazard Tags*** - must be used to identify actual or potential presence of a biological hazard or to identify equipment, containers or rooms that may be contaminated with biohazardous materials.

41.4 Safety Color Codes for Marking Physical Hazards

41.4.1 Color codes

Potentially hazardous conditions may also be indicated by color codes.
The following safety-color coding system has been adopted by the School Board of Brevard County.

Safety Red indicates immediate ***"Danger",*** *demands special precautions and is normally used for:*

- Fire protection equipment and apparatus (alarm boxes, fire extinguishers, etc.).
- Safety cans or portable containers used to transport flammable liquids.
- Danger signs and tags.
- Emergency stop bars on hazardous machines.
- Emergency stop buttons or electrical switches used for emergency stopping machinery.

Safety Orange indicates ***"Warning",*** *a level of risk between danger and caution and is normally used for:*

- Designation of machine hazards such as exposed edges of cutting devices, pulleys, and gears.
- Used to accent parts of a machine or inspection doors, which may have been left open.
- Used for guards that cover a specific hazard and must be in place, as well as for electrical boxes that contain stop/start buttons.

Safety Yellow indicates ***"Caution".*** *There is a potential danger and requires safe work practices and caution and is used to identify:*

- Critical parts of a machine, such as wheels, levers and controls for adjustments.
- Traffic lanes.
- Handrails, guardrails, low overhead projections, approaches to stairs, barricades, protruding parts, anything that you could strike against, stumble over, fall into or over or be caught in between.

Safety Green indicates ***"Safety" and "First Aid"*** *and is used to identify:*

- Safety equipment and fist aid stations.
- Locations for stretchers, eye wash stations, safety bulletin boards, personal protective equipment (PPE) and drench showers.

Safety Blue (with white letters) indicates ***"Information"*** *and is used to identify:*

- Equipment or machinery under repair.
- Signs that indicate "Out of Order", "Do Not Remove", or "Do Not Operate".

Safety White indicates ***"Traffic Markings" or "Housekeeping"*** *and is used to identify:*

- The direction of traffic or (in combination with stripes of black) barricades.
- Used to mark stock storage, trash containers, sinks, clean-up areas, etc.

Safety Purple indicates ***"Radiation Hazards"*** *and is used for:*

- Radiation warning lights and containers for radioactive materials.
- May be used in combination with safety yellow.

41.5 Training

- Employees must receive instruction in the various types of signs and tags so that they will recognize when a hazardous condition exists and take appropriate action. The information covered in this Section is to be reviewed with all new employees.

41.6 Recordkeeping

41.6.1 Retention

Record	Maintained By	Retention
Training	Environmental Health and Safety Office	Most Current

Section 42: Tool Safety

42.1 Introduction

It is important that each employee understand the potential dangers associated with the tools they use. Each employee must be provided with instruction in the operation of the tools they use so that they will understand how to operate these tools safely and responsibly.

29 CFR 1910.241-243 **29 CFR 1926.301-304**

42.2 Responsibilities

- The responsibility for implementing and maintaining this Program rests with the individual supervisors involved.
- Employees are to inspect tools prior to use and remove defective tools from service until they have been repaired or replaced.

Supervisors are responsible for ensuring that their employees are properly trained in the operation of any tool that they are expected to operate.

42.3 Safety Precautions - All Tools

42.3.1 General

- Only hand and powered portable tools that meet accepted safety standards are to be provided.
- When necessary, appropriate personal protective equipment (PPE) is to be used when operating tools to ensure employee safety.
- Damaged or malfunctioning tools must not be used; they are to be tagged "OUT OF SERVICE" until repaired. *Repairs of defective power tools are to be made to manufacturer's original specifications.*
- Employees are to use the correct tool for the work to be performed; if they are unfamiliar with the operation of the tool, they need to request instruction from their supervisor before starting a job.
- In a flammable atmosphere, where sparks might provide an ignition source, non-sparking tools (brass, plastic, aluminum or wood) need to be used.
- Tools are to be used and operated according to the manufacturer's instructions.

42.4 Safety Precautions - Power Tools

42.4.1 General Safety Rules

- Never carry a tool by the cord or hose and never yank the cord or hose to disconnect it from a receptacle.
- Keep cords and hoses away from heat, oil and sharp edges.
- Disconnect tools when not in use, before servicing and when changing accessories such as blades, bits and cutters.
- All observers should be kept a safe distance away from the work area.
- Secure work with clamps or a vise, freeing both hands to operate the tool.
- Avoid accidental starting. NEVER hold a finger on the switch button while carrying a plugged-in tool.
- Maintain tools in sharp, clean and good condition for best performance.
- Be sure to keep good footing and maintain good balance.
- The proper apparel is to be worn. Loose clothing, ties or jewelry can be caught in moving parts.
- Hazardous moving parts of a power tool must be safeguarded.

- All hand-held circular saws with a blade >2 inches in diameter and chain saws must have a constant pressure switch, control or throttle that will shut off the power when the pressure is released.
- Hand-held power drills, tappers, drivers, grinders with wheels > 2 inches in diameter, belt sanders, reciprocating saws, saber, scroll and jig saws with blade shanks greater than ¼ inch and similar power tools, must have a constant pressure switch or control. *A lock-on control is permissible if turnoff can be accomplished by a single motion of the same finger that turned it on.*
- All fixed power driven woodworking tools must be provided with a disconnect switch that can be locked or tagged in the off position.

- If machinery could automatically start up after a power failure or cut-*off the equipment must be equipped with devices that will prevent such an event.*
- Tools or machinery designed for a fixed location are to be securely anchored to prevent walking or moving.

42.4 Safety Precautions - Power Tools - Continued

42.4.2 Grounding

- Tools must be double-insulated or effectively grounded and tested.
- Testing to ensure that a tool is grounded, must be done before initial issue, after repairs and after any incident that could cause damage, such as dropping it or exposure to a wet environment.
- Grounded tools are always to be used with an effectively grounded circuit. Any extension cord used with a grounded tool must be a three-wire, grounded type.
- Electric-powered hand tools used on construction sites, on temporary wired circuits or in wet environments, need to be used in conjunction with an approved ground fault circuit interrupter (GFCI).

42.5 Safety Precautions - Powered Abrasive Wheel Tools

42.5.1 General

- An abrasive wheel needs to be inspected closely and sound- or ring-tested to be sure that it is free from cracks or defects.
- The wheel must fit on the spindle properly and the maximum operating speed marked on the wheel cannot be exceeded.
- The spindle nut needs to be tightened enough to hold the wheel in place, without distorting the flange.
- Never stand directly in front of the wheel as it accelerates to full speed; there is a possibility that the wheel could disintegrate or explode during start-up.
- Portable grinding tools should be equipped with safety guards.
- When using a powered grinder, always use eye protection, turn off the power when not in use and never clamp a hand-held grinder in a vise.
- Never grind material that is not compatible with the type of abrasive wheel being used.

- Adjustable work rests on floor and bench-mounted grinders must be kept at a distance of 1/8 inch or less from the wheel surface.

42.6 Safety Precautions - Pneumatic Tools

42.6.1 General

- Pneumatic tools are powered by compressed air and include chippers, drills, hammers and sanders.
- Eye protection is required and face protection recommended for employees working with pneumatic tools.

- A short wire or positive locking device attaching the air hose to the tool can serve as an added safeguard.
- A safety clip or retainer needs to be installed to prevent attachments from being unintentionally shot from the barrel. (Example: chisels on a chipping hammer)
- Compressed air guns are never to be pointed toward anyone.

Compressed air cannot be used for cleaning purposes unless the pressure has been reduced to less than 30 p.s.i. and appropriate eye protection is worn.

42.7 Laser Pointers

42.7.1 General Safety Rules

- Never look directly into the laser beam.
- Never point the beam at a person.
- Do not aim at reflective surfaces.
- Do not allow children to use laser pointers unless supervised by an adult.
- No not view a laser pointer using an optical instrument. (binoculars, microscope)
- Use only laser pointers that are FDA certified and labeled.

42.8 Recordkeeping

42.8.1 Records Retention

Record	Maintained By	Retention
Maintenance/Inspection Records	**Supervisor**	**12 months**
Training	**Supervisor**	**Most Current**

Section 43: Training

43.1 Introduction

Training is to be provided to ensure that all employees possess the necessary knowledge and skills to perform their work safely. Job specific training is provided as well as that required by federal and state laws. Employees are required to participate in training and records are maintained.

43.2 Training: Required

The following training is to be completed by School Board of Brevard County employees, if applicable to their job classification and function. The type of training, who must be trained and the required frequency are listed.

- ***Accident Prevention Signs, Tags and Warning Labels*** - Employees need to be instructed in recognition of the colors, wording and meaning of accident prevention signs, tags and warning labels, as required by *OSHA 29 CFR 1910.144-145*.
  Required: Initially upon assignment and as required thereafter.
  Content:
  - √ Meaning of signs, tags and warning labels; including the appropriate colors and wording;
  - √ What actions must be taken when encountered.
- ***Asbestos*** - Required for employees who have the potential of being exposed to airborne concentrations at or above the action level (9.1 f/cc 8 TWA), per *OSHA 29 CFR 1910.1001* and *29 CFR 1926.1101*. The level of training required is dependent upon the work to be performed.
  Required: Initially upon assignment and **annually** thereafter.
  Content:
  - √ See the *Asbestos Section* of this Plan for specific training requirements.
- ***Back Safety and Proper Lifting Techniques*** - Employees who must lift, twist or have potential exposure to back injuries. No specific OSHA regulation but covered under *OSHA's General Duty Clause 5(a)(1)*.
  Required: Initially upon assignment and as required thereafter.
  Content:

- √ Safe lifting techniques.

- ***Biohazardous Waste Management*** - Employees who must handle biomedical waste as a part of their work responsibilities, must receive training per *State of Florida Rule 10D104 FAC.*

  Required: Initially upon assignment and **annually** thereafter.

  Content:

  - √ Contents of the department's Biohazardous Waste Management Plan;
  - √ Procedures for identification, handling and management of biohazardous waste.

- ***Bloodborne Pathogens*** - Employees who may reasonably anticipate coming into contact with blood or other potentially infectious materials as part of their job duties per *OSHA 29 CFR 1910.1030.*

  Required*:* Initially upon assignment and **annually** thereafter.

  Content:

  - √ Definition of bloodborne pathogens;
  - √ What diseases they cause;
  - √ Workplace exposures;
  - √ Infection prevention;
  - √ Personal protective equipment;
  - √ Hepatitis B vaccination-effectiveness & availability;
  - √ Post-exposure procedures;
  - √ Labeling;
  - √ Waste disposal;
  - √ *OSHA 29 CFR 1910.1030.*

- ***Cadmium Safety -*** Required for employees with potential exposure, (normally pertains to laboratory work) per *OSHA 29 CFR 1910.1027.*

  Required: Initially upon assignment and **annually** thereafter

  Content:

  - √ Health effects of cadmium exposure;
  - √ Engineering controls and work practices;
  - √ Procedures necessary for protection;
  - √ Purpose and description of medical surveillance;
  - √ Review of OSHA Standard.

- ***Crawler Locomotive and Truck Cranes*** - Required for all employees who operate such cranes per *OSHA 29 CFR 1910.180.*

  Required: Initially upon assignment and periodically thereafter.

  Content:

  - √ Safe crane operation;
  - √ Inspections of cranes and lifting equipment;
  - √ Content of *29 CFR 1910.180*;

- √ Equipment specific information.

- ***Demolition-Preparatory Operations*** - Employees who must determine the condition of a structure and the possibility of collapse before demolition begins, (Competent Person) must receive training per *OSHA 29 CFR 1926.850*.

  Required: Initially upon assignment and as required to maintain proficiency.

  Content:

  - √ How to prepare written surveys of structures;
  - √ How to determine condition of framing, floors and walls;
  - √ How to determine the possibility of unplanned collapse;
  - √ Hazard recognition.

- ***Electrical Safe Work Practices*** - Required for employees who face the risk of electric shock during performance of their work per *OSHA 29 CFR 1910.331-335*.

  Required: Initially upon assignment and as required thereafter.

  Content:

  - √ Proper safe work procedures;
  - √ De-energization;
  - √ Hazards of electrical work;
  - √ Location of electrical hazards;
  - √ Personal Protective Equipment

- ***Emergency Procedures and Fire Prevention*** - All employees covered by the department plan per *OSHA 29 CFR 1910.38*.

  ***Required*:** Initially upon assignment and as required thereafter.

  Content:

  - √ Proper evacuation procedures;
  - √ Duties of employees during an emergency;
  - √ Means of reporting emergencies;
  - √ Fire hazard exposures.

- ***Employee Alarm Systems*** - Required for all employees who must respond to an alarm during an emergency per *OSHA 29 CFR 1910.165*.

  Required: Prior to startup of the process, if procedures change, and **every three years.**

  Content:

  - √ Inform employees of the location of the Emergency Call List;
  - √ Emergency reporting procedures;
  - √ Recognition of the alarm sound. (May combine with Emergency Procedures and Fire Prevention Training.)

Ergonomics - Employees who are exposed to cumulative trauma disorders. No specific OSHA standard but may be covered under the *General Duty Clause (5)(a)(1).*

Required: Initially upon assignment and as required thereafter.

Content:

- √ Signs and symptoms of cumulative trauma disorders (CTDs);
- √ How to recognize risk factors;
- √ How to recognize and report symptoms;
- √ Prevention techniques, such as use, adjustment and maintenance of tools and equipment and best work procedures for minimizing risk;
- Õ Job specific training appropriate to the task, such as safe lifting procedures, how to set up an office workstation, etc.

- ***Excavations*** – Competent persons who are required to inspect excavation work must be trained per *OSHA 29 CFR 1926.652*.

  Required: Initially upon work begins and as required thereafter.

  Content:

  - √ Training sufficient to ensure that the "competent person" has sufficient knowledge, as shown in the *29 CFR 1926.652*, to conduct daily inspections;
  - √ Knows the risks associated with trenching and excavation work;
  - Õ Understands how to protect employees from these hazards

- ***Fall Protection*** - Employees who are exposed to fall hazards during performance of construction work must receive training per *OSHA 29 CFR 1926.503*.

  Required: Initially upon assignment and as required thereafter.

  Content:

  - √ Hazards of elevated work;
  - √ Safe work procedures to control or minimize;
  - √ Fall protection;
  - √ Personal fall arrest systems.

- ***Fire Detection Systems*** - Required for all employees who service, maintain or test fire detection systems per *OSHA 29 CFR 1910.164*.

  Required: Initially upon assignment and as required thereafter.

  Content:

  - √ Knowledge necessary to perform functions.

- ***Fire Extinguisher*** - All employees who might be expected to use fire extinguishers must be trained in their selection and use per *OSHA 29 CFR 1910.157*.

  Required: Initially upon assignment and **annually** thereafter.

  Content:

  - √ Recognition of types of fires and hazards;
  - √ Selection of proper class fire extinguisher;
  - √ How and when to fight a fire.

- ***First Aid*** - Required for all employees who must render first aid as part of their job per *OSHA 29 CFR 1910.151*

  Required: Initially upon assignment and **every 2-3 years** dependent upon issuing agency (i.e.; Red Cross, Central Florida Safety Council or American Heart Association.)

  Content:

  - √ Content of training determined by the specific program and specific requirements to receive certification.

- ***Fixed Extinguishing Systems*** - Required for all employees who must inspect, maintain, operate or repair fixed extinguishing systems per *OSHA 29 CFR 1910.160*

Required: Initially upon assignment with **annual** review of competency.
Content:

- √ Knowledge necessary to perform functions.

- ***Forklift and Powered Handtrucks*** - Training is required for those who operate a powered industrial truck per *OSHA 29 CFR 1910.178*.

  ***Required*:** Initially upon assignment and as required thereafter with evaluations every three **years**.

  Content:

  - √ The operating instructions, warnings and precautions for the type of truck the operator will be authorized to use;
  - √ The differences between the operation of an automobile and a powered industrial truck;
  - √ The location, purpose and function of the operating controls and instrumentation;
  - √ Engine or motor operation;
  - √ Steering and maneuvering;
  - √ Visibility - including restrictions due to loading;
  - √ Fork and attachment adaptation - operation and use limitations;
  - √ Vehicle capacity and stability;
  - √ Inspection and maintenance requirements;
  - √ Refueling, recharging and battery change-out procedures;
  - √ Surface conditions where the vehicle will be operated;
  - √ Load compositions and stability;
  - √ Load manipulation, stacking and unstacking;
  - √ Safety in pedestrian traffic areas;
  - √ Operation in restricted places or narrow aisles;
  - √ Hazardous locations and their classifications;
  - √ Operation on ramps or other sloped surfaces;
  - √ Closed environments and other areas where insufficient ventilation could cause a concentration of carbon monoxide exhaust in excess of permissible exposure limits (PELs);
  - √ Any other environmental hazards that could affect safe operation.

- ***Handling Hazardous Materials (HM126)*** - Required for employees who, load, unload, or handle hazardous materials; for those who prepare hazardous materials for transportation; for those who are responsible for transporting hazardous materials; and those who operate a vehicle used to transport hazardous materials per *DOT 49 CFR Parts 171-180*.

  Required: Every **3** years

  Content:

  - √ General awareness and familiarization with requirements of the DOT regulations;
  - √ Marking, labeling and packaging procedures;
  - √ Safety and emergency response;
  - √ Job specific training.

- ***Hazard Communication (Right to Know)*** - All employees who may be exposed to hazardous chemicals in the performance of their job per *OSHA 29 CFR 1910.1200*.

  ***Required*:** Initially upon assignment and as required thereafter.

  Content:

  - √ Requirements of the OSHA Standard;
  - √ Site Hazard Communication Program;
  - √ Material Safety Data Sheets-how to read, interpret and where they are located at the site;
  - √ Chemical exposures;
  - √ Labeling;
  - √ Detection of spills and leaks;
  - √ Emergency response.

- ***Hazardous Waste Operations and Emergency Response (HazWOper)*** - Required for all employees who must respond to an emergency spill or release of a hazardous chemical per *OSHA 29 CFR 1910.120*. (Level of training varies with assignment of responsibilities, 8 hour, 24 hour or 40 hour.)

  Required: At the time of job assignment with an 8 hour **annual** refresher.

  Content:

  - √ Level of training varies with assignment of duties. Please review the *Emergency Response Section* for specific requirements.

- ***Hearing Protection*** - Employees who are exposed to 85 dB for 8 hours time weighted average (TWA_8) as determined by noise assessments and monitoring per *OSHA 29 CFR 1910.95*.

  Required: **Annually**

  Content:

  - √ Effects of noise on hearing;
  - √ Purpose, advantages, disadvantages and selection of hearing protection devices;

- √ Fitting, use and care of hearing protection devices;
- √ Explanation of audiometric testing.

- ***Laboratory Safety*** - Required for employees who are exposed to hazardous chemicals and work in a laboratory per *OSHA 29 CFR 1910.1450*.

  Required: Initially upon assignment and as required thereafter.

  Content:

  - √ Protective measures for working with chemicals;
  - √ Safe work precautions and procedures;
  - √ Emergency response procedures;
  - √ Personnel protective equipment requirements;
  - √ Contents of the department *Chemical Hygiene Plan*.

- ***Ladders and Stairways*** - Employees who are required to use ladders and stairways during performance of construction work must receive training per *OSHA 29 CFR 1926.1060.*

  Required: Initially upon assignment and as required thereafter.

  Content:

  - √ How to inspect a ladder for defects;
  - √ Hazard recognition;
  - √ Procedures to minimize hazards.

- ***Lead Safety -*** Required for employees with potential exposure to airborne lead at any level, per *OSHA 29 CFR 1910.1025*.

  Required: Initially upon assignment

  Content:

  - √ The School Board must inform those with potential exposure of the content of *Appendices A and B of 29 CFR 1910.1025*.
  - √

  At this time no School Board employees are subject to exposure to lead at or above the action level. Should this change, more comprehensive training requirements would apply in accordance with *29 CFR 1910.1025*.

- ***Lockout and Tagout*** - Authorized, affected and all other employees need to receive training at the level required for their exposure or participation in jobs where unexpected energizations may pose hazards per *OSHA 29 CFR 1910.147*.

  Required: Initially upon assignment with retraining as indicated by annual program inspections.

  Content:

  - √ Purpose and function of the program;
  - √ Location and types of hazardous energy sources in workplace;
  - √ How to use isolation and control methods.

- √ Training requirements vary for "authorized" ,"affected" and "other" employees - see the *Lockout/Tagout Section* for specific information.)

- ***Office Safety*** - Employees who are exposed to hazards specific to an office environment. No specific OSHA regulation but covered under *OSHA 5(a)(1), General Duty Clause*.
  Required: Initially upon assignment and as required thereafter.
  Content:
  - √ Hazard recognition;
  - √ Safe work precautions and procedures.

- ***Overhead Cranes*** - Required for all employees who operate overhead and gantry cranes per *OSHA 29 CFR 1910.179*.
  Required: Initially upon assignment and as required thereafter.
  Content:
  - √ Proper positioning;
  - √ Rigging and movement of loads;
  - √ Inspections;
  - √ Safe work precautions and procedures.

- ***Permit-Required Confined Spaces*** - All employees involved in permit-required confined space entry work per *OSHA 29 CFR 1910.146*.
  ***Required*:** Initially upon assignment and as required thereafter
  Content:
  - √ Affected personnel must recognize permit-required confined spaces and know hazards of unauthorized entry;
  - √ Entrants, attendants and supervisors must receive training in use of equipment, symptoms of exposure, duties and responsibilities;
  - √ Rescuers must receive appropriate level of training in order to perform required duties;
  - √ See the *Confined Spaces Section* for more specific information.

- ***Personal Protective Equipment (PPE)*** - Each employee who is required to wear PPE must be trained per *OSHA 29 CFR 1910.132*.
  Required: Initially upon assignment and as required thereafter
  Content:
  - √ Limitations, care and use of PPE;
  - √ Selection of proper PPE;
  - √ Proper fit;
  - √ How to put on and remove PPE.

- ***Respiratory Protection*** - Employees required to use respiratory protection are to be instructed and trained in the proper selection, use and maintenance of respirators in accordance with the company's written program per *OSHA 29 CFR 1910.134.*
  Required: Initially and **Annually** thereafter.
  Content:
  - √ Proper selection of respirator;
  - √ Use, care and maintenance of respirator;
  - √ Routine and emergency use;

- √ Fit testing.

- ***Scaffolding*** - Employees who erect, move or dismantle scaffolding during performance of construction work, (Competent Person) must receive training per *OSHA 29 CFR 1926.454*.
  Required: Initially upon assignment and as required thereafter.
  Content:
  - √ Selection of proper scaffolding for each job;
  - √ Proper safe procedures for erecting, moving and dismantling scaffolding;
  - √ Knowledge of the OSHA standard.

- ***Servicing of Multi-piece and Single-piece Rim Wheels*** - Required for all employees who must service rim wheels per *OSHA 29 CFR 1910.177*
  Required: Initially upon assignment and as required to maintain proficiency.
  Content:
  - √ Hazards involved in servicing rim wheels;
  - √ Specific safe work procedures to be followed.

- ***Signaling*** - Required for employees who give signaling directions per *OSHA 29 CFR 1926.201*.
  Required: Initially upon assignment and as required thereafter.
  Content:
  - √ *Manual on Uniform Traffic Control Devices for Streets and Highways per ANSI D6.1-1971.*

- ***Site Clearing*** - Required for employees engaged in site clearing operations per covered by construction standard *OSHA 29 CFR 1926.604.*
  Required: Initially upon assignment and as required thereafter.
  Content:
  - √ Must be informed of the first aid treatment for irritants and toxic plants they may encounter before work begins.

- ***Slings (Rigging and Lifting)*** - Employees designated as authorized to inspect slings per *OSHA 29 CFR 1910.184.*
  Required: Before performance of work and as required thereafter
  Content:
  - √ How to inspect for fitness, damage and defects.

- ***Vehicle-Mounted Elevating and Rotating Work Platforms*** - Employees who must operate platforms per *OSHA 29 CFR 1910.67* and as required by *1926.453* during construction work.
  Required: Initially upon assignment and as required thereafter.
  Content:
  - √ Purpose and function of operating controls;
  - √ Manufacturer's operating instructions and safety rules for use;
  - √ Understand all warnings, decals and instructions as shown.

- ***Welding and Cutting*** **(Preservative Coatings)** - Employees who weld, cut or heat surfaces covered by a preservative coating for which the flammability is unknown, during the performance of construction work, must receive training per *OSHA 29 CFR 1926.354*.

Required: Initially upon assignment and as required thereafter.
Content:

- √ Must be trained to determine flammability of surfaces before operations are conducted. (May include in a general welding training class.)

- ***Welding Safety (*Arc)** - Employees who use arc welding equipment must receive training per *OSHA 29 CFR 1910.254*.
  Required: Initially upon assignment and as required thereafter.
  Content:
  - √ Operating instructions;
  - √ Safe operating procedures.

- ***Welding Safety (*Gas)** - Employees who use fuel gases for welding and cutting during the performance of construction work, must receive training per *OSHA 29 CFR 1926.350.*
  Required: Initially upon assignment and as required thereafter.
  Content:
  - √ Instructions in safe use of fuel gases;
  - √ Contents of OSHA standard;
  - √ Information in *ANSI Z49.1-1967*. (May include in a general welding training class)

- ***Welding Safety* (General)** - Employees who weld, braze or use torches, who service welding machines and employees designated as fire watchers during welding procedures, must receive training per *OSHA 29 CFR 1910.252.*
  Required: Initially upon assignment and as required thereafter
  Content:
  - √ Safe operation of welding and cutting equipment;
  - √ Firewatcher's responsibilities, if applicable.

- ***Woodworking Tools*** - Required for employees who must operate such tools during performance of construction work per *OSHA 29 CFR 1926.304*.
  Required: Initially upon assignment and as required thereafter.
  Content:
  - √ Hazards of the equipment;
  - √ Safe methods of operation.

In addition to the training listed in this Section, job-specific training may also be required. Each Section of this Plan should be reviewed and training guidelines as presented in each adhered to.

Section 44: Vehicle and Driver Safety

44.1 Introduction

Employees, who use School Board of Brevard County vehicles or personal vehicles for School Board business, must do so in such a manner that vehicle-related accidents and incidents are avoided. Each driver must establish and maintain an overall driving record, which exemplifies careful driving habits and meets the criteria prescribed in the *Safe Driver Plan*.

Separate vehicle and driver safety rules and guidelines are published for School Board of Brevard County bus drivers.

44.2 The *Safe Driver Plan*

44.2.1 Employee Information

- The *Safe Driver Plan* will be applicable to all current and prospective drivers of School Board of Brevard County Vehicles, or personal vehicles driven while on official School Board business.
- Effective July 1, 1998, a copy of the *Safe Driver Plan* must be given to each new employee who will be operating a School Board vehicle.
- The employee must indicate by their signature that they have read and understand the requirements of the Plan.
- The director of Transportation will be responsible for monitoring all driving records.

44.2.2 The Safe Driver Committee

- The Safe Driver Committee is responsible for administering the Plan.
- The Committee will meet on a regular basis and review any accidents, damage, or tickets, etc. related to the operation of School Board vehicles.
- They will review both personal tickets and School Board driving records and vote to determine how many points may be assessed to the employee's School Board of Brevard County driving record. Points will not be assigned until court action (if applicable) is taken. *The effective date of points assigned will be the date of the first meeting following the date of a conviction.*

44.2.3 Reporting

- ***All Drivers must report the following to their Supervisor and Safety Officer:***
  - √ All accidents and violations in which they are involved as the driver of a Board-owned vehicle.
  - √ All accidents and violations in which they are cited or charged as the driver of a non-Board owned vehicle.
  - √ All evidence of damage to assigned vehicles.
  - √ Any suspension or revocation of their driver's license.

- Incidents must be reported on the **next duty day** to their immediate **supervisor** and **Safety Officer**.
- Failure to report as required, or making false or misleading reports, may be grounds for termination or other disciplinary action.

No driver will be allowed to drive for the School Board of Brevard County without a proper license or when such license is under suspension or revocation.

44.3 Safe Driving Rules

44.3.1 General

- Drivers must have a valid Florida driver's license for the type of vehicle driven.
- Drivers and passengers must wear seat belts at all times.
- Before starting the vehicle, passengers must be seated and doors closed.
- Adjust seat and steering wheel; find a comfortable driving position.
- Always drive defensively and try to anticipate what other drivers may do.
- Obey all signs and signals.
- Keep alert, check mirrors frequently and look far down the road to anticipate dangerous situations that may develop.
- Never tailgate, use the "two second rule". *Pick out a road sign or other object, as the vehicle in front of you passes it, count "one, one thousand one - one, one thousand two. If you reach the object before you finish counting you are following too close. Increase count to four seconds in inclement weather*.

44.3.1 General – Continued

- Use the left lane for passing, otherwise keep to the right.
- Signal lane changes as well as turns.
- If you are stopped in traffic and waiting to turn left, keep the wheels aimed straight ahead. If you are hit from behind and the wheels are turned to the left, you could be pushed into incoming traffic.
- Slow down before you enter a turn and brake softly.
- Employees must not use cellular phones or radios while driving. *Studies show that using a car phone while driving quadruples the risk of having an accident. Pull over to a safe area to use them.*
- Don't stare at approaching headlights when driving at night. If you are inadvertently blinded, focus on the right shoulder of the road.
- NEVER drive when sleepy. Pull over and rest or walk for a few minutes.
- Never drive under the influence of alcohol or drugs, including prescription or over-the-counter medications, which may make you drowsy.
- All School Board vehicles are to have headlights on at all times.

44.3.2 Backing

- Check behind and around the vehicle before backing.
- Back up slowly.
- Use mirrors.
- It is recommended that you always use a spotter if you cannot see behind you.

44.3.3 Parking

- Avoid parking on hills or curves.
- Get off the road as far as you can.
- Do not impede the flow of traffic.
- Turn the engine off.
- Put in park and set the emergency brake.
- Remove the keys and close the doors.

44.4 Inspection/Maintenance

- All School Board of Brevard County vehicles must be inspected prior to use each day to ensure good operating condition and maintenance is to be performed at required intervals.
- Records of daily inspections will be addressed as part of the overall safety inspection program.
- Routine maintenance, adjustments and repairs are to be performed by a qualified repair person and recorded according to each machine's established schedule and according to OSHA requirements.

44.5 Training

- All drivers must understand state and municipal driving rules, School District driving requirements, accident reporting procedures and defensive driving concepts in order to

operate their vehicles in the safest manner possible. Specific equipment training, as well as a structured course, may be required with employee attendance mandatory.

44.6 Special Requirements

- A vehicle that is used at remote locations needs to carry a first aid kit for the employee's individual use.
- If there are any activities conducted at remote locations involving flames, sparks, etc., a fire extinguisher must be carried.
- If flammable materials are transported in the vehicle a fire extinguisher must be carried.
- If hazardous materials of any classification are transported, DOT regulations (*49 CFR 100-180*) must be followed and a *Commercial Drivers License (CDL)* may be required.

44.7 Inclement Weather

- If visibility is reduced by fog, rain or snow, reduce speed and turn on low beams. NEVER USE BRIGHT LIGHTS, this will increase glare and reduce visibility.
- Keep windshield clean and use wipers. If the wipers are on, the lights are to be on also.
- SLOW DOWN and allow extra space between your vehicle and the one in front.
- Drive slowly through puddles and keep pressure on the brakes to protect the brake linings from getting wet. Test brakes when clear.

44.7 Inclement Weather – Continued

- If your vehicle starts to skid DO NOT BRAKE, instead:
  - Remove foot from accelerator;
  - Steer toward the direction you want the front of the vehicle to go;
  - As the vehicle comes out of the skid, straighten wheels slowly;
  - Brake gently until stopped;
  - Pull off the road if you need to and wait for better conditions.

44.8 Emergencies

44.8.1 Tire Blowout

- Hold steering wheel firmly;
- Slowly remove foot from gas pedal;
- Don't use the brake until the vehicle is under control;
- Get off the road as soon as it is safe.

44.8.2 Brake Failure

- Gently use emergency or parking brake;
- Shift to lower gear to slow down.

44.8.3 Stuck Gas Pedal

- Try to lift using toe;
- Shift to neutral, use brake to slow down;

- Get off the road;
- DO NOT TURN OFF KEY, STEERING MAY BE LOST.

44.8.4 Drifting off Pavement

- DON'T YANK THE STEERING WHEEL BACK;
- Ease foot off gas and brake gently;
- Steer GENTLY back onto the pavement when it is safe to do so.

44.8.5 Going into Water

- If the vehicle is floating, DO NOT OPEN THE DOOR;
- Remove seat belt, escape through the window;
- If the vehicle sinks, get into the rear seat where an air pocket may form;
- Escape through a window when vehicle settles.

44.8.6 Vehicle Approaching Head-On

- Slow down;
- Pull to RIGHT and sound horn;
- NEVER SWING INTO LEFT LANE.

44.8.7 Fire

- If you see smoke or flames, turn off ignition;
- Get away from the car;
- Call **9-1-1**.

44.10 Recordkeeping

44.10.1 Records

- Maintenance/service logs and inspection records must be completed and retained for 1 year and include:
  - Date of the inspection, maintenance and/or service;
  - Signature of inspector and/or repair person; and

44.10.2 Retention

Record	Maintained By	Retention
Inspection Records	**Transportation Compound**	**1 Year**
Maintenance and Service Logs	**Transportation Compound**	**1 Year**
Training	**Transportation Compound**	**1-year**

Section 45: Ventilation

45.1 Introduction

During the performance of assigned work, some School Board of Brevard County employees may be exposed to dusts, vapors, fumes and gases. It is also possible that students in Vocational Programs may have exposure. Since many of these substances can be hazardous if excessive levels are present or if permissible exposure limits (PELs) are exceeded, ventilation must be used to either remove or dilute these airborne substances.

ENGINEERING CONTROLS IS ALWAYS THE FIRST LINE OF PROTECTION. RESPIRATORS SHOULD BE USED ONLY IF ENGINEERING CONTROLS, SUCH AS VENTILATION, ARE NOT ENOUGH TO LOWER CONTAMINANTS TO A PERMISSIBLE LEVEL.

29 CFR 1910.94 **29 CFR 1926.57**

45.2 Mechanical Ventilation

There are many different types of ventilation systems, but all have the same purpose: to control environmental hazards and provide clean, safe, breathable air. The components need to be designed and maintained so that a volume and velocity of exhaust air sufficient to remove dusts, fumes, vapors or gases is provided.

When installing any system, it is critical that exhaust stacks and air intakes be located so that the contaminated air will not be recirculated within the work area or other buildings.

45.2.1 General Exhaust Ventilation

- Used to provide oxygen, *supplies and exhausts large volumes of air.*
- **Will only work if**:
  - The contaminants are not highly toxic;
  - The employee is not too close to the source of the contaminant;
  - The concentration is low; and
  - The contaminants are produced at a fairly uniform rate.
- Two main types of general ventilation are:
  1) *Exhaust ventilation* - draws contaminated air out of an area and used where the atmosphere could be flammable or toxic.

2) *Supply ventilation* - blows fresh air in. (NEVER USE OXYGEN)

45.2.2 Local Exhaust Ventilation

- Local ventilation captures contaminants at their point of origin and removes them. *This is the best way to control flammable and toxic materials produced at a single point.*
- Typical local exhaust ventilation systems include the following components:
  - *Hoods* - may enclose the process and capture the contaminants.
  - *Ducts* - carry the contaminants from the hood.
  - *Fans* - move the air through the system.
  - *Air Cleaners* - use filters, precipitators and scrubbers to clean contaminants from the air.
- **Use during:**
  - Welding and cutting;
  - Cleaning with solvents; or
  - Work with hazardous chemicals at a single point.

45.3 Workplace Applications

45.3.1 Permit-Required Confined Space Entry

- *Ventilation is required if:*
  - The air contains too much or too little oxygen (>23.5% and <19.5%);
  - The atmosphere is flammable; or
  - The air is toxic.
- Ventilation must be completed before entry.

45.3.2 Welding and Cutting Operations

- Adequate ventilation (general or local) must be provided to protect the welder and others from smoke and fumes.
- The air movement needs to be sufficient to prevent accumulation of toxic fumes or possible oxygen deficiency in a confined area.

45.3.2 Welding and Cutting Operations - Continued

- A local exhaust system may be required to keep toxic gases below the PELs, especially if welding or cutting metals such as galvanized steel or metal painted with lead- bearing paint, which may include the following:
  - Zinc
  - Brass
  - Bronze
  - Lead
  - Cadmium
  - Beryllium

45.3.3 Working with Laboratory Chemicals

Always review the MSDS for each chemical. If ventilation is required, this information will be provided. Always check the permissible exposure limits (PELs) and flammability rating.

If a substance is volatile or has a permissible exposure limit (PEL) <50 ppm, a laboratory hood must be used for chemical procedures where there could be a release of hazardous chemical vapors or dust.

- *When using local exhaust ventilation*:
  - Place hood opening as close as possible to the source of the air contaminant;
  - Clear the screen on the face of the hood prior to usage;
  - Ensure that the hood fan operates when the hood is in use;
  - Always operate the fan for an additional period of time in order to clear residual contaminants from the ductwork.
- *Laboratory hoods - safe work practices*:
  - Ensure that the hood ventilation is operating before opening chemical containers inside the hood. *Hold a piece of paper at the face of the hood and observe the movement of the paper.*
  - Keep the sash of the hood closed at all times except when adjustments within the hood are being made. At these times, maintain the sash height as low as possible.
  - Minimize storage of chemicals and equipment inside the hood.
  - Do not allow interference with the inward flow of air into the hood.
  - Leave the hood operating when it is not in active use if hazardous chemicals are contained inside the hood or if it is uncertain whether adequate general laboratory ventilation will be maintained when the hood is non-operational.
  - DO NOT use the hood to dispose of volatile chemicals.

45.3.4 Battery Charging and Storage Areas

- Must be well ventilated or have outside vents.
- Must have venting arranged to prevent fumes, gases or electrolyte spray from entering other work areas.

45.3.5 Grinding, Polishing and Buffing Operations

- Local exhaust ventilation must be provided if PELs may be exceeded.

45.3.6 Flammable and Combustible Materials

- *Storage of flammable and/or combustible materials*:
  - Ventilation must be provided in flammable storage areas to prevent the accumulation of flammable/explosive vapors and gases. *If mechanical ventilation is provided it must be explosion-proof.*
- *Paint spray booths:*

- Mechanical ventilation capacity must be ≥100 CFM times the total area of booth openings and be capable of maintaining the concentration of vapors below 25% of the Lower Flammable Limit (LFL).
- Filter pads need to be installed to prevent excessive accumulation of deposits in ducts and discharge of residue through duct outlets.
- A gauge and alarm must be installed to indicate that air velocity is maintained.

45.4 Indoor Air Quality

45.4.1 Air Contaminants

Inadequate or improper ventilation is the cause of about half of all indoor air quality (IAQ) problems in non-industrial workplaces.

- *Indoor air contaminants may include*:
  - Particulates
  - Pollen
  - Microbial agents
  - Organic toxins
  - Mold and fungi

45.4.1 Air Contaminants - Continued

- *Indoor air contaminants may be transported by the ventilation system or originate in*:
  - Wet filters
  - Wet insulation
  - Wet undercoil pans
  - Cooling towers
  - Volatile organic and reactive chemicals may be transported from areas in other parts of the building.
  -
- *Preventative measures*:

Controlling micro-organisms (microbial agents):

- √ Prevent moisture buildup in occupied spaces.
- √ Prevent moisture collection in HVAC systems.
- √ Remove stagnant water and slime from mechanical equipment.
- √ Use filters with 50% to 70% collection efficiency rating.
- √ Find and discard microbe-damaged furnishings and equipment.
- √ Provide regular preventive maintenance.

Controlling organic or reactive chemical contaminants:

- √ Identify and eliminate or isolate the source.
- √ Provide additional dilution ventilation.

Controlling tobacco smoke in the air:

- √ Establish dedicated smoking areas configured so that smoke does not migrate into non-smoking areas.

45.5 Inspections

45.5.1 General - (All Systems)

- *Daily*
  - √ Visually inspect hoods, ductwork, access and clean-out doors and generally determine that the system is in good working order.
- *Weekly*
  - √ Check the air cleaner capacity, fan housing and pulley belts.
- *Monthly*
  - √ Check the air cleaner components.

45.5.2 Laboratory Ventilation Systems - Continued

- Lab ventilation systems are to be inspected **monthly**.
- Inspection records will be kept on file for review.
- *Inspect*:

Hoods
- √ Located close to the source of contamination.
- √ Air removal capacity great enough to control the contaminants.
- √ The hood face velocity maintained between 75 and 125 feet per minute.

Ducts
- √ As straight as possible, sharp bends cut down on air flow efficiency.
- √ Clean.
- √ Holes and leaks sealed.
- √ Duct velocity maintained at a minimum of 3500 feet per minute.

Fans
- √ Strong enough to do the job.
- √ Check that belts are not loose.
- √ Clean.

Air Cleaners (filters, scrubbers, etc.)
- √ Clean.
- √ If disposable, replaced per manufacturer's instructions.

Report any malfunction of a ventilation system immediately to a supervisor.

Drawings, specifications, operating instructions and other manufacturer-provided manuals or paperwork need to be maintained on file for review. Retain as long as the equipment is in use.

45.6 Ventilation in Schools (Student Occupied Areas)

45.6.1 General Requirements

Any areas where odors or contaminants are generated, such as kitchens, sculleries and storage rooms must be mechanically ventilated. Exhaust systems from sources of odor may not be combined with other building ventilating systems.

45.6.2 Vocational Areas

- **Kiln rooms** must be provided with exhaust to dispel heat to the exterior and not connected to any other exhaust system.
- **Chemistry labs and science rooms** equipped with fume hoods must be designed with a high capacity emergency exhaust system providing 20 air changes per hour and may be provided with positive ventilation via doors or windows to the exterior. *Signs providing instructions must be permanently installed at the emergency exhaust system fan switch and adjacent to the door or window to be opened.*
- **Chemistry labs** must be provided with fume hoods. Fume hood exhaust fans must automatically shut down when the emergency exhaust fan is turned on.
- **Wood working areas** must install dust collectors and exhaust systems in accordance with NFPA 91, "*Blower and Exhaust Systems*."
- **Automotive repair shops** must install engine exhaust systems.
- **Welding shops** must install fume removal and exhaust systems.

45.7 Recordkeeping

45.71 Records Retention

Record	Maintained By	Retention
Inspections*	**Principals and Facility Supervisors**	**12 Months**
Manufacturers' Operating Instructions/Manuals for Ventilation Systems	**Principals and Facility Supervisors**	**Life of Equipment Use**

** See Monthly Inspection Report*

Section 46: Vocational and Technical Safety

46.1 Introduction

It is important that instructors in the Vocational and Technical programs instill in each of their students an awareness of the hazards they may be exposed to and the safety procedures they must follow in order to protect them from illness or injury. The following Section of this Plan provides the **minimum** safety rules and practices that students must follow when participating in such programs. These rules and practices are derived from the Brevard County Public Schools' *A Safety Guide for Vocational Education Programs, State Requirements for Educational Facilities* and State of Florida Statutes.

It is also recommended that instructors in the Vocational and Technical programs review other applicable sections of this Plan for additional information.

Florida Chapter 239.221 ***A Safety Guide for Vocational Education Programs***

46.2 Responsibilities

46.2.1 Instructors

- Discuss school safety with the principal and advise of safety-related needs.
- Evaluate the classroom for hazardous conditions and initiate corrective action if any are found. Deficiencies and unsafe conditions should be reported in a written record to principals or other designated persons.
- Provide a safety education program to students before their potential exposure to dangers/hazards. Signs must identify hazardous work and storage areas.
- Specify and provide protective equipment as needed and ensure its use.
- Give adequate instruction in the proper, safe use of tools and equipment.
- Suspend the applicable portion of a program until unsafe conditions have been corrected or unsafe equipment repaired or replaced.
- Remove unsafe equipment or tools from service.
- Constantly inspect the facilities and provide safeguards to ensure that there are no hazards and that mechanical, physical and environmental safeguards are provided to encourage safe operation.
- Ensure that students follow all safety rules established and enforce in a consistent manner. *Adequate supervision must be provided at all times!*
- Investigate all accidents and incidents and initiate corrections to prevent reoccurrence.

46.2.2 Students

- Follow the instructor's safety procedures and rules at all times.
- Use only materials, tools or equipment they are authorized to use.
- Incorporate safety into every procedure.
- Wear or use protective equipment as directed.
- Report all accidents or incidents immediately.
- Never take chances or shortcuts.
- Ask questions when there is any doubt concerning safety.
- Never tamper with anything they don't understand.

46.3 Safety Color Codes for Marking

46.3.1 Color codes

The following safety-color coding system has been adopted by the Brevard Vocational Education Department to promote safety and reduce accidents in vocational laboratories. Potentially hazardous conditions may be indicated by color codes.

*Safety Red indicates immediate **"Danger",** demands special precautions and is normally used for:*

- Fire protection equipment and apparatus (alarm boxes, fire extinguishers, etc.).
- Safety cans or portable containers used to transport flammable liquids.
- Danger signs and tags.
- Emergency stop bars on hazardous machines.
- Emergency stop buttons or electrical switches used for emergency stopping machinery.

*Safety Orange indicates **"Warning",** a level of risk between danger and caution and is normally used for:*

- Designation of machine hazards such as exposed edges of cutting devices, pulleys, and gears.
- Used to accent parts of a machine or inspection doors, which may have been left open.
- Used for guards that cover a specific hazard and must be in place, as well as for electrical boxes that contain stop/start buttons.

46.3.1 Color codes - Continued

*Safety Yellow indicates **"Caution".** There is a potential danger and requires safe work practices and caution and is used to identify:*

- Critical parts of a machine, such as wheels, levers and controls for adjustments.
- Traffic lanes.
- Handrails, guardrails, low overhead projections, approaches to stairs, barricades, protruding parts, anything that you could strike against, stumble over, fall into or over or be caught in between.

*Safety Green indicates **"Safety" and "First Aid"** and is used to identify:*

- Safety equipment and fist aid stations.
- Locations for stretchers, eye wash stations, safety bulletin boards, personal protective equipment (PPE) and drench showers.

*Safety Blue (with white letters) indicates **"Information"** and is used to identify:*

- Equipment or machinery under repair.
- Signs that indicate "Out of Order", Do Not Remove", or "Do Not Operate".

Safety White indicates ***"Traffic Markings" or "Housekeeping"*** *and is used to identify:*

- The direction of traffic or (in combination with stripes of black) barricades.
- Used to mark stock storage, trash containers, sinks, clean-up areas, etc.

Safety Purple indicates ***"Radiation Hazards"*** *and is used for:*

- Radiation warning lights and containers for radioactive materials.
- May be used in combination with safety yellow.

46.4 Fire Safety

46.4.1 Fire Prevention

46.4.1.1 Housekeeping

- All areas need to be kept free of trash and combustibles. Rubbish, waste and other debris must be cleaned up and removed daily and disposed of in suitable containers outside of the building.
- Oily or paint-soaked rags should be placed in covered containers or safety containers and emptied daily.
- Spills of flammable/combustible materials must be cleaned up **immediately** using proper equipment and materials.
- Flammable fumes or excessive dust produced must be mechanically exhausted to the outside using explosion-proof ventilation equipment.

46.4.1.2 Flammable Gases (propane, acetylene, natural gas, butane, etc.)

- Equipment, piping, regulators and igniters in flammable gas systems must be inspected by qualified persons before use and periodically.
- Matches should not be used for igniting gas-fired equipment.
- Suspected gas leaks must be reported **immediately**.

46.4.1.3 Flammable or Volatile Liquids (paints, varnishes, lacquers, petroleum products, solvents, etc.)

- Students should be aware of the danger of fire and/or explosion when working with flammable materials.
- Flammable liquids must be used and stored in well-ventilated areas to avoid vapor build up.
- Must be kept away from flames and sparks.
- Must be stored and transported in approved safety cans and kept in a **flammable** safety cabinet.
- Containers must be bonded and grounded during transfers to avoid static build up.

46.4.1.4 Electrical Fire Hazards

- Ensure that motors and other electrical devices are kept clean and properly maintained.
- Wiring must be done by qualified persons.
- Electrical equipment should be inspected periodically.
- Examine electrical cords for breaks and fraying.
- Use properly rated fuses and circuit breakers.
- Check equipment for overheating.

46.4.1.5 Open Flames, Welding and Torch Operations

- Work is not to be done in areas where open flames are not normally permitted, such as in areas or on equipment where oxygen, flammable gases or liquids or chemical vapors may be present.
- Areas need to be clear of combustible materials or covered with flame retarding material.
- A fire extinguisher of the appropriate class must be readily accessible in all areas where there may be open flames.
- Proper clothing should be worn when working near open flames.

46.4.1.6 Molten Metals and Heated Surfaces

- Heated surfaces on furnaces, flues, heating devices, dryers and light bulbs can cause fires if flammable or combustible materials are close enough to absorb sufficient heat to cause combustion. Care should be taken to insure that all such devices are properly installed, especially with respect to clearance and barrier materials.
- Molten metal can ignite any flammable material with which it comes in contact. Precautions should be taken to provide a flame-proof environment in foundry areas.

46.4.1.7 Smoking Policy

- Smoking is strictly prohibited in shops and laboratories.

46.4.2 Fire Extinguishers

46.4.2.1 Classes

- Fire extinguishers are to be provided in shops, classrooms and laboratories where fire hazards exist. They must be of the appropriate class for the type fires that could occur.

46.4.2.2 Requirements

- Fire Extinguishers must be:
  1) Mounted properly, accessible and have the locations clearly identified.
  2) Visually inspected **monthly** by qualified facility personnel and **annually** by a certified outside contractor.
  3) Hydrostatically tested at the required interval.
  4) Recharged and replaced after each use.

Fire extinguishers may only be used by those who have received training in their use and outside emergency agencies must be notified before firefighting activities begin.

46.5 Electrical Safety - Continued

46.5.1 Preventing Electrical Shock in Vocational and Technical Programs

- Only electrical equipment certified by an approved testing laboratory. (UL approved) may be used.
- All electrical equipment, wiring and devices must be inspected regularly and properly maintained.

- Motors, extension cords and portable tools must be grounded. *Portable tools may be double insulated instead.*
- Students should be instructed in general electrical principles and the dangers associated with the use of electricity.
- Ground-fault circuit interrupters (GFCIs) must be used with portable equipment when working on bare ground, in damp or wet conditions, or on conductive surfaces. *Always check the GFCI for operation before use.*
- Ensure that hands are dry before plugging or unplugging electrical devices.

46.6 Personal Protective Equipment

46.6.1 General Requirements

- Instructors must evaluate student exposures and determine the level of personal protective equipment (PPE) that is necessary after all steps have been taken to eliminate the hazards through engineering or other controls.
- The School Board of Brevard County must provide required PPE and a supply maintained on hand by the instructor.
- Students must be instructed in the proper use, fit and maintenance of PPE.
- Students must keep their PPE in a clean and sanitary condition. *Cleaning and disinfecting materials will be provided.*
- All PPE must be ANSI-approved, if applicable.

46.6.2 Face Protection

- Faceshields may be necessary to shield the face from flying particles, chemical or hot metal splashes and heat radiation. These activities can include:
  - √ Sawing or buffing metal, sanding or light grinding or handling corrosive chemicals;
  - √ Forging, where protecting from furnace heat is required;
  - √ Working with hot molten metals;
  - √ Arc welding, where protection from radiation is necessary;

Faceshields DO NOT provide eye protection and should be worn over suitable eye protection if it is determined hazards to the eye exist.

46.6.3 Eye Protection

- Students, teachers and visitors in vocational or industrial arts shops or laboratories must wear eye-protective devices at any time when they are engaged in observing an activity or the use of hazardous substances likely to cause injury to the eyes.
- Eye-protective devices must be worn by during the following activities:
  - √ Working with hot molten metals;

- √ Milling, sawing, turning, shaping, cutting, grinding, or stamping of any sold material using power equipment;
- √ Heat treatment, tempering or kiln firing of any metal or other materials;
- √ Gas or electric arc welding and cutting;
- √ Working with caustic or explosive materials;
- √ Working with hot liquids, or solids including chemicals that are flammable, caustic, toxic or irritating.

46.6.4 Hearing Protection

- If the noise in industrial vocational education areas cannot be reduced to a safe level, hearing protection should be worn by those exposed.
- Students must be instructed in how to use, clean and maintain hearing protection devices, or whether they are one-use disposable only.
- The type hearing protection (earplugs, earmuffs, or sound bands) selected should be based on comfort and effectiveness.

46.6.5 Foot Protection

- If a student or instructor will be exposed to impact from falling or rolling objects or if they may need protection from sharp objects, safety shoes or foot guards should be worn
- Foot protection is normally indicated for construction and automotive mechanic programs.
- Since it is usually difficult to get students to purchase safety shoes, foot guards should be kept on hand. *Students must wear sturdy work-type shoes for these to be effective.*

46.6.6 Respiratory Protection

- Approved respirators and dust masks should be used when the air is contaminated with excessive concentrations of harmful dusts, fumes, mists, gases, or vapors. *"Excessive" would be levels above National Institute of Occupational Safety and Health (NIOSH) threshold limit values (TLVs).*
- Before respiratory protection is used, engineering controls, such as ventilation, should be first used to control or eliminate the contaminants or lower the levels to acceptable concentrations.
- Students must be trained in the use and limitations of respirators as well as proper fitting and maintenance.
- Filters, cartridges and canisters must be replaced if:
  - The end-of-service-life indicator (ESLI) is activated;
  - The change-out schedule indicates a need to do so;
  - If a need is otherwise indicated.
- Respirators must be cleaned and sanitized after each use and stored in a clean, dry place inside sealed plastic bags.

46.6.7 Hand Protection

- Gloves should be worn to protect hands from harmful substances and temperature extremes as well as cuts, lacerations, abrasions, etc.

- √ ***General purpose work gloves*** provide minor protection against abrasions, cuts, punctures and minor temperature exposures. *(Example: handling cylinders, metal, wood, etc.)*
- √ ***Chemical-resistant gloves**** need to be worn to prevent chemical contact with and absorption of hazardous chemicals into the body. The appropriate glove needs to be used for each type of chemical. *(Examples: nitrile for solvents and butyl rubber or natural rubber for caustics, etc.)*
- √ ***Leather gauntlet gloves*** need to be worn when welding or cutting or for protection against temperature extremes.

****Consult the MSDS and the glove and chemical manufacturer for assistance in determining the appropriate glove to be used for a particular chemical.*

46.6.8 Head Protection

- ANSI-approved helmets or hard hats are required when students or instructors need protection from impact blows, penetration from flying and falling objects and from electric shock.
- The following are the new ANSI classifications; only Class E may be used for electrical work:
  - *Class G (General)*
  - *Class E (Electrical, Non-Conductive)*
  - *Class C (Conductive)*
  - *Class D (Firefighting)*
- Protective hair covering may be necessary for persons with long hair who work at machines since hair may become entangled in moving parts. Protective caps should cover the hair completely; bandanas or turbans are not adequate and may introduce their own hazards.
-

46.7 Chemicals

Chemicals that exhibit the characteristics of reactivity, instability, spontaneous decomposition, flammability, corrosiveness or toxicity, must be handled with care. These chemicals would be classified as hazardous and could cause illnesses or injuries to persons exposed to them in addition to property damage.

46.7.1 General Chemical Safety Rules

- Instructors must obtain material safety data sheets for all chemicals used in student activities.
- Before students work with or use chemicals, instructors must define the hazards of such chemicals and explain how exposure could occur.
- Appropriate chemical spill kits should be maintained in the area.
- Students should read the label and review the material safety data sheets (MSDS) paying special attention to the health hazards, fire and explosion hazards, safe work precautions and emergency response procedures.

- Only those chemicals approved by the School Board of Brevard County may be used. *NO chemical on the prohibited list (See Appendices) may be used.*
- Students should never handle, taste, or smell a chemical unless directed to do so by the instructor. If it is necessary to smell the contents of a test tube or other container, students should be instructed to waft some of the escaping vapors towards themselves. *The container should never be brought to the nose.*
- Never look directly down into a test tube, view it from the side.
- Always wash hands thoroughly after potential exposure to chemicals and NEVER eat or drink in the working area.
- Appropriate personal protective equipment, such as a lab coat, apron, protective glasses or goggles must be worn. Refer to the MSDS and instructor recommendations.
- In shops, labs and areas where students may handle corrosives, a safety shower, floor drain and eye wash facility must be provided.

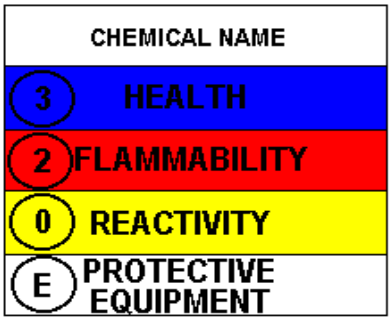
46.7.2 Chemical Spills

- Report a chemical spill to the instructor IMMEDIATELY!
- If a chemical is spilled on skin or clothing, rinse the affected area with plenty of water. If the eyes are affected, hold the eyelids apart and flush with water for 10 to 15 minutes and seek immediate attention from a nurse or physician.
- If students inhale chemicals and exhibit symptoms of overexposure, remove to a safe well-ventilated area and seek immediate medical attention.
- Keep other students away from the spill area. The instructor must determine whether or not it is safe to clean up the spill. ONLY minor spills, those that pose no significant health or safety hazard to the faculty or students may be cleaned up. At no time should an instructor attempt to respond to a chemical spill that presents any significant threat to health or safety. SIGNIFICANT SPILLS REQUIRE ACTIVATION OF THE SCHOOL'S EMERGENCY PROCEDURE PLAN.
- Using the MSDS as a reference, determine the level of PPE that must be worn and the proper clean up procedures.
- Place any absorbent and discarded materials into a suitable storage container and label. Broken glass and liquids must be placed in puncture and leak-resistant containers. *Contact the appropriate administrator for disposal instructions.*

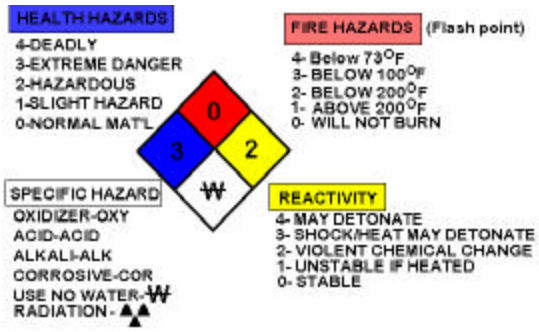
46.7.3 Chemical Labeling

Labels on chemicals must list the hazardous ingredients and indicate the health and physical hazards either by using words, symbols, colors or numbers. The following labels are examples of National Fire Protection Association (NFPA) and Hazardous Materials Identification System (HMIS) labels.

HMIS LABEL



NFPA LABEL



PPE GUIDE	
A	(SG)
B	(SG) (G)
C	(SG) (G) (SA)
D	(FS) (G) (SA)
E	(SG) (G) (DR)
F	(SG) (G) (SA) (DR)
G	(SG) (G) (VR)
H	(SpG) (G) (SA) (VR)
I	(SG) (G) (DVR)
J	(SpG) (G) (SA) (DVR)
K	(AL&H) (G) (FuS) (B)
X	OBTAIN SPECIFIC INSTRUCTIONS.

SAFETY GLASSES (SG)
SPLASH GOGGLES (SpG)
FACE SHIELD (FS)
AIR LINE & HOOD/MASK (AL&H)
GLOVES (G)
SYNTHETIC APRON (SA)
BOOTS (B)
FULL SUIT (FuS)
DUST RESPIRATOR (DR)
VAPOR RESPIRATOR (VR)
DUST & VAPOR RESPIRATOR (DVR)

46.8 Emergency Response

46.8.1 General

It is important that every instructor understand not only how to prevent accidents and injuries, but also how to respond if an emergency situation arises. Usually such an occurrence is unexpected and demands an immediate reaction. In order to deal with such emergencies in a prompt, calm and professional manner, instructors must be familiar with the facility or school's Emergency Procedures Plan and evacuation routes.

- Instructors should review the *Emergency Procedures Section* of this Plan along with the required Site Specific information.
- An evacuation chart should be posted in the classroom and reviewed with the students at the beginning of the school year and periodically thereafter.

46.8.2 General Emergency Response Procedures:

- Call **9-1-1** if there is a fire or a life-threatening emergency and remove the students and evacuate the area.
- Notify an administrator if a fire, chemical spill, accident or injury occurs.
- Dependent upon the nature of the emergency, it may be necessary to call the school nurse.

46.8.3 Chemical Spills or Exposures

- Follow the recommendations in Part 46.7.2 of this Section if there is a chemical spill or student exposure.

46.8.4 Fires

- Follow the recommendations in Part 46.4 of this Section.
- Remember to remove students from the area, turn off gas outlets and electricity, if possible to do so safely and call **9-1-1**.
- At no time should an instructor attempt to fight a fire unless it is small, the instructor is trained to do so and exits are not blocked.

46.9 Specific Applications

46.9.1 Industrial and Technology Education

Industrial and Technology Education programs employ potentially hazardous machinery, materials, equipment and activities. Students who participate in these programs must be protected by the development of a safe working environment. The instructors must create this environment with assistance from school administration and the Environmental Health and Safety Department. The following **area-specific** safety rules are provided, in addition to those shown in the previous parts of this section, to assist Industrial and Technology Education Instructors in the establishment of a "safe shop".

46.9.1.1 General Safety Rules

- Loose clothing and jewelry must not be worn when working with machinery.
- Hair must be kept away from moving parts. *A hair restraint or net may be necessary to prevent hair from becoming entangled in moving parts.*
- Students must be dressed appropriately as indicated by the Instructor.
- No student may operate powered machinery or tools until they have received thorough instruction in both the operation and safety precautions and have received approval from the instructor.
- All machinery and portable power tools must be electrically grounded or double-insulated.
- Belts, pulleys, gears, shafts, moving parts and point of operation on machinery must be guarded. (See the *Machine Guarding Section* of this Plan.)

- Defective equipment and/or tools must be reported immediately and tagged "OUT OF ORDER" or "DO NOT USE" or with some equally effective message and removed from service until repaired or replaced.
- Equipment designed to be permanently mounted must be secured to the floor or other supporting surface.
- Guards or safety appliances may not be removed unless the machine is stopped and/or unplugged and then only for cleaning, repairing and adjustment. *Guards must be replaced immediately after such activities are concluded*
- If machinery could automatically start up after a power failure or cut-*off the equipment must be equipped with devices that will prevent such an event*.
- If areas have unprotected gas cocks, compressed air valves, etc. easily accessible to students, master control valves with clearly marked permanently attached handles *near the instructor must be provided.*

46.9.1.1 General Safety Rules - Continued

- Electrically powered machinery accessible to students must have one (1) or more "RED" colored disconnect switches in a convenient location. (Office machines, domestic sewing machines and other non-hazardous machinery are excluded.)
- All equipment must have an individual starting device and power shut-off within reach of the operator.
- Safety zones must be marked on floor areas around machinery/equipment. *Remain outside the safety zone when someone else is operating machinery.*
- Piping systems must be visibly identified by legend, flow arrows and color-coding per ANSI A13.1.
- Read all posted warning signs and posters and comply with their instructions.
- Wear eye protection and PPE as required and instructed.
- Keep machines and work areas clean. Keep doors and drawers closed.
- Use the right tool for the job.
- Make sure that hand tools are in good condition, no loose handles, mushroomed heads, cracked blades, etc.
- Do not carry tools with sharp points or edges in pockets.
- When using cutting tools, cut away from the body.
- Clean up spilled oil, grease and cutting fluids immediately.
- NO HORSEPLAY! Do not distract anyone working with machinery.
- Stop the machine completely before leaving the area.
- Clean up the area and store tools and materials in their proper place.
- Tools, materials, extension cords, hoses or debris should not be strewn about in a manner, which may cause tripping or other hazards.

46.9.1.2 Metalworking – Additional Safety Rules

- Use a brush or stick to remove metal chips, NOT your hands.
- Place all scrap material in designated containers.

46.9.1.3 Construction – Additional Safety Rules

- Hard hats must be worn when anyone is working above you or in any area where objects might fall Areas will be posted, "HARD HAT AREA".
- Personal fall arrest systems, guardrails, nets or some type of guarding must be used when working six (6) feet or more above the work surface. (See the *Elevated Work Section* of this Plan for guidelines.)
- Only enter a roped off or barricaded area if authorized to do so by the instructor.
- If ladders and scaffolding are used, the *Elevated Work Section* of this Plan should be referenced for the best safe work practices.

46.9.1.3 Construction – Additional Safety Rules – Continued

- Lumber and building materials must be stacked so that it is stable, level and self-supporting.
- Nails must be removed from used lumber before it is stacked for storage.
- Cement and lime must not be stacked more than ten bags high unless retained by adequate supports.
- Brick must be stacked on an even, sold surface and must not be stored on scaffolds or runways in excess of normal supplies for immediate brick laying operations.
- Floor, wall and partition blocks should be stacked in tiers on solid, level surfaces. When stacked higher than six feet, the stack must be set back and secured to prevent toppling.
- All scrap lumber, waste material and rubbish must be collected and stored in containers or in piles for regular removal.
- Protruding nails in boards, planks and timbers must be removed, hammered in or bent over flush with the wood.
- When using fiberglass and resin, use in well-ventilated areas, keep vapors away from open flame and use respiratory protection as necessary.

46.9.1.4 Automotive – Additional Safety Rules

- Keep hands away from moving parts.
- Use care when handling engines. Use proper lifting techniques.
- Vent exhaust to outside of the building. KNOW THE DANGERS OF CARBON MONOXIDE (CO).
- Check fuel engines for leaks prior to start up.
- Securely fasten engines to a bench or test stand before testing.
- Let engines cool before removing the radiator cap.
- If compressed air is used for cleaning, it must not exceed 30 psig and eye protection must be worn. Be careful of others in the area.
- NEVER use compressed air to clean clothing and never point the nozzle towards another person.
- When working in the engine compartment or under the dash, disconnect the battery ground connection.

- Avoid tripping hazards! Keep jack handles out of the way and stand creepers against the wall when not in use.
- Use extreme care when inflating and changing tires. Us a tire cage when working with split rims. (See the *Heavy Equipment and Fleet Service Section* of this Plan for detailed instructions for working with split rims.)
- Use a faceshield when pressing bearings on or off shafts. Do not exceed the capacity pressure of the press and limit personnel in the area to two (2).
- Only licensed persons, with the instructor's permission, may move or drive vehicles into or out of a shop area for servicing or road tests. USE EXTREME CARE!
- Do not start the engine in a vehicle with anyone standing directly in front of or behind the vehicle without the instructor's permission.
- Do not store oil-soaked clothing in lockers.
- Place safety stands under a vehicle that has been jacked up before work is performed.
- Make sure the vehicle is centered when lifting with a jack and NEVER jack up a vehicle with someone in or working on or under it.
- Check vehicle lifts, ensure that they are equipped with mechanical safety locks before working under a vehicle.
- Only non-flammable solvents may be used for cleaning. *Gasoline must never be used; it is extremely flammable.*
- Keep sparks and open flame away from batteries. *Hydrogen gas may be released and only a spark could ignite it and cause an explosion.*
- Never disconnect or connect a battery charger to a battery with the charge on. Turn the charger off before making any connections.
- Be very careful when working with electrolyte. Sulfuric acid is extremely corrosive and could cause painful burns to the skin and damage the eyes. GLOVES AND A FACESHIELD SHOULD BE WORN WHEN SERVICING BATTERIES.
- Wear foot/toe guards or safety shoes when removing or installing a battery.
- When making a lift with a hoist, inspect all chains, hooks, cables, ropes, etc. along with the crane or hoist before making the lift. Do not use any that are defective. Position the crane or hoist directly over the item to be lifted and check attachments. Lift a few inches and ensure that the load is balanced. Keep unnecessary persons out of the area and NEVER allow anyone under a suspended load. See the *Cranes Section* of this Plan.
- Students who spray paint must wear protective clothing, safety glasses and respiratory protection if required. (See the MSDS for specific requirements.)

46.9.1.5 Graphics – Additional Safety Rules

- Read and follow the manufacturer and instructor's directions before using machines or chemicals.
- If a paper jams in the press, stop all motors before clearing the jam.
- Paper cutters must be locked when not in use. Only one person may operate a paper cutter at one time.
- If more than one person is working on a press, collator, folder or other piece of equipment, only one person, by arrangement, may start the machine and only after giving a prearranged signal.

46.9.1.6 Drafting – Additional Safety Rules

- Avoid looking directly at the printing machine light.
- Use caution when adjusting drafting tables.
- Do not sit or lean on drafting tables and do not tip drafting stools.
- Do not apply excess pressure on light tables.

46.9.1.7 Electrical and Electronics – Additional Safety Rules

- Review the *Electrical Safety* section of this Plan along with part 46.5 (Electrical Safety) of this section.
- Consider all wires and terminals as live and "HOT" until proven otherwise by a safe method.
- Chassis of AC-DC radios should be kept clear of any grounded conductors. Use an isolation transfer if available; otherwise, determine polarity and reverse the plug if necessary.
- Disconnect power cords before touching anything behind the front panel of a transmitter, receiver, amplifier or other device.
- Remove headphones before working on equipment.
- Make sure capacitors are discharged before touching them.
- Do not wear metal jewelry when working on electrical equipment.
- Keep one hand in your pocket or behind your back when using a test probe. *In case of contact with electricity, this will provide a route away from vital organs.*
- Wear gloves, safety glasses and a faceshield when handling cathode-ray tubes. Old CRTs should be smashed in a large steel barrel by dropping a heavy metal rod through a hole in the top of the barrel. *Store CRTs so there is no danger of breakage.*

46.9.1.8 Welding – Additional Safety Rules

- Before allowing students to perform welding operations, the Instructor should review the welding equipment manufacturer's recommendations for safe operations along with the applicable safe work precautions shown in the *Welding Safety* section of this Plan.

46.9.1.9 Art Metal Work – Additional Safety Rules

- Rubber gloves must be worn when working with acids or other chemicals.
- An apron or shop coat should be worn.
- Do not hold metal with a cloth while buffing it on a cloth or wire wheel.
- Use goggles or a faceshield when soldering, using acids or power machinery/tools.
- Remove burrs from edges of metal after cutting.
- When submerging articles in an acid bath, place them gently into the liquid to avoid splashing.
- Allow articles coming from a kiln to cool before being handled with bare hands.
- Etch only in well-ventilated areas.
- When using a buffing wheel, hold the workpiece against it in such a manner that the cloth wheel will not catch the workpiece.

46.9.1.10 Foundry Operations – Additional Safety Rules

- Use extreme care in foundry areas. Equipment and castings could be HOT!

- Be aware that a malfunctioning gas-fired furnace could cause a fire and/or explosion. USE EXTREME CARE AND FOLLOW MANUFACTURER'S INSTRUCTIONS CAREFULLY.
- Keep molds covered until ready for pouring.
- Place molds on a board or low, solid stand. Do not place on a workbench.
- Before handling molten metal, don protective clothing, including a faceshield, apron, leggings and gloves. Make sure Duck boards are in place.
- Keep flammable materials away from the foundry area.
- Practice lifting and pouring with a cold, empty crucible.
- Light the furnace only when directed to do so by the instructor, using the manufacturer's instructions.
- Preheat metal to drive off moisture before placing it in a crucible containing molten metal.
- Preheat the skimmer before using it.
- Shut of the GAS FIRST, then the air, when finished with the furnace.
- Carry ladles and crucibles close to the floor to reduce danger.
- If the floor is concrete, have someone standing by to shovel foundry sand on spills. *Concrete can explode violently when heated.*
- Keep water and wet items away from the foundry area.
- Allow castings to cool before breaking them out of molds.
- When using polystyrene (Styrofoam™) patterns:
  1) Once pouring has started, keep sprue basin filled to prevent polystyrene from firing back through the sprue.
  2) Do not breathe the fumes from burning polystyrene! Ventilate or use a respirator.
- Completely empty the crucible. Solidified metal will crack the crucible when reheated. Use ingot molds rather than pouring a puddle in the sand.
- Clean up after ramming or pouring a mold.

46.9.1.11 Bench Furnaces – Additional Safety Rules

- Always make sure gas valves are OFF before attempting to light a bench furnace. Follow the manufacturer or instructor's directions.
- Wear eye and face protection and a leather apron.
- Place soldering copper on a proper rest when not in use.
- Do not overheat coppers. Do not inhale fumes from soldering fluxes. Use adequate ventilation.
- Use care in wiping excess solder from copper.
- Wipe up spilled flux immediately.
- When finished, turn off the furnace and place a "HOT" sign on it.

46.9.1.12 Kilns – Additional Safety Rules

- Replace electric coils if they turn dark brown and small areas of darker eruptions or patches become visible.
- Provide adequate ventilation throughout the entire firing process. Exhaust systems must dispel heat to the exterior and not be connected to any other exhaust system.
- Kiln rooms must have smoke/heat detectors connected to the fire alarm system.

- Cool the kiln for several hours after shutoff before opening.
- Kilns must not be located near paths of exit and must be placed in a separate room when serving students through grade three (3).
- Ensure that the kiln has shut off before leaving the school.

46.9.2 Business and Technology Education

- Instructors should review the safe work procedures as shown in the *Office Safety* and *Ergonomics Sections* of this Plan along with the applicable parts of this Section. This information should be presented to students before their participation in the Business Technology Education programs.

46.9.3 Family and Consumer Sciences Education

46.9.3.1 Food Science and Related Areas – Additional Safety Rules

- Instructors should review the *Food Service Safety* Section of this Plan and provide students with safe work procedures for those engaged in food related activities.
- Refrigerator temperatures must be kept below 7° Celsius, (45° Fahrenheit) and equipped with a thermometer as required to meet health standards.

46.9.3.2 Clothing Construction and Related Areas – Additional Safety Rules

- Keep hair away from moving parts.
- Make only equipment adjustments for which you are trained.
- Replace burned out bulbs immediately.
- Do not put pins or needles in your mouth.
- Keep scissors closed when not in use and do not put open scissors or other sharp objects on the machine.
- Use both hands to raise the head of the machine.
- Keep the feet off the power control when threading the machine.
- Do not start or stop the machine by turning the balance wheel with the hand.
- Keep fingers a safe distance from the needle of the machine.
- Keep the feet off the power control when replacing the needle.
- Do not pull the fabric through the machine.
- Close the bed plate before operating the machine.
- Turn off the motor when cleaning or oiling the machine.
- Turn off the motor when the machine is not in use.
- Never operate equipment with the guards removed.
- Unplug pressing equipment when not in use.

46.9.3.3 Human Care and Related Areas – Additional Safety Rules

- **Supervision**
  - √ Never leave children alone even when they are sleeping or using the bathroom.
  - √ Be constantly alert for any dangerous situation and watch children carefully when they are using play equipment that could present hazards.
  - √ Keep the child care environment safe by checking for:
    - Litter and scattered toys that could cause tripping or block traffic lanes;
    - Broken, sharp or unsafe toys;
    - Open cabinet doors or drawers;
    - Uncovered electrical outlets;
    - Knives, or other sharp objects;
    - Matches or lighters;
    - Open garbage containers;
    - Missing guards on heaters, fans, furnaces, etc.;
    - Spills.
  - √ Never use filmy plastic items in the child care area.
  - √ Select lead-free blinds, paints and finishes for furniture, toys, and equipment.
  - √ Secure rugs to prevent tripping or stumbling.
  - √ Teach the children "Safety Rules".
  - √ Become familiar with poisonous plants and trees.
  - √ Store chemicals and medicines in locked, approved cabinets.
- **Cleaning and Disinfecting the Child Care Environment**
  - √ Surfaces most likely to come into contact with children, such as toys, crib rails, fool preparation areas and diaper-changing areas must be cleaned with soap and water, disinfected with a germicidal (tuberculocidal) disinfectant, washed in the dishwasher or on the hot cycle of a washing machine.
  - √ Bathroom surfaces – such as faucet handles and toilet seats, should be washed and disinfected daily or more frequently if necessary.
  - √ When using a commercial disinfectant, ALWAYS read the label and MSDS and follow directions completely. (See the Chemical Safety part of this Section)
  - √ Wear utility gloves, decontaminate after removal and wash hands thoroughly.
- **Hand washing**
  - √ *Children* should wash hands:
    - Upon arrival;
    - Before and after eating;
    - After toilet activities;

After outside play,
After handling pets or cages;
If hands are visibly dirty;
Before leaving.

- √ *Providers* should wash hands:
  Upon arrival;
  Before handling food, preparing bottles or feeding children;
  After using the toilet, assisting a child using the toilet, or changing diapers;
  After contact with a child's body fluids (including contaminated items such as diapers);
  When hands are visibly dirty;
  After handling pets or cages;
  After cleaning and decontamination duties;
  After removing gloves for any reason;
  Before giving or applying medication or ointment to a child;
  Before going home.

- **Cleaning up Body Fluids**
  - √ When cleaning up spills of body fluids, including blood, feces, nasal and eye discharges, saliva, urine and vomit, wear protective gloves unless the fluid can be contained by the materials being used to clean it up.
  - √ Clean and disinfect contaminated surfaces and discard the fluid-contaminated materials in a sealed plastic bag.
  - √ Disinfect mops or cleaning equipment with a "virulcidal" or "tuberculocidal" disinfectant, wring out and allow to dry.
  - √ Wash hands thoroughly after removing gloves. Discard or decontaminate gloves after removal.
- **Reducing Back Injuries**
  - √ Use proper lifting technique: Keep the child as close as possible and avoid any twisting motion. Lower crib rails before lifting the child out.
  - √ Do not carry children for long distances. Use carriages, etc.
  - √ Use adult-height changing tables.

46.9.4 Health Sciences Education

- Instructors should review the safe work procedures as shown in the *Bloodborne Pathogens Section* of this Plan along with the applicable parts of this Section. This information should be presented to students before their participation in the Health Sciences Education programs.
- Instructors must provide students with information regarding contagious diseases and protective measures to be taken.
- If students will be working around but not using radioactive materials, they must be informed of the type radiation, applicable terminology and safety measures to be taken to protect them from exposure.
- The high prevalence of back injuries in the industry should be discussed along with good preventative techniques and work practices.
- Students must not operate any sterilization equipment or use any disinfecting procedures without instruction and authorization.
- Perform only those procedures for which you have been approved or qualified.

- The appropriate level of PPE, as recommended in the *Bloodborne Pathogens Section* of this Plan and the instructor, must be worn.
- Properly identify each patient before starting a procedure.
- Report any injury, needlestick or potential exposure to blood or body fluids immediately.

Section 47: Walking and Working Surfaces

47.1 Introduction

To avoid falls, it is essential that the walking or working surface be safe. The following guidelines are recommended along with general safety awareness in order to prevent injuries from slips, trips or falls.

29 CFR 1910.21-23

47.2 Floors

47.2.1 General

- Workroom floors must be in a clean and, as much as possible, dry condition. Clean up spills **immediately**. Put up warning signs or barriers around wet floors.
- Drainage mats, platforms or false floors are recommended where wet processes are performed.
- Floors must be free from protruding nails, splinters, holes and loose boards or tiles.
- Eliminate trip hazards by keeping work areas clean of scattered tools or materials.

47.2.2 Aisles and Passageways

- Must be large enough to provide safe clearance and in good repair.
- Permanent aisles or passageways need to be clearly marked.
- There must be enough clearance for a person to pass safely where mechanical handling equipment is used and turns are made (including doorways).

47.2.3 Covers and Guardrails

- Must be provided to protect employees from falling into open pits, tanks, vats, ditches, etc.
- Floor holes (<12 inches) must be protected by covers that leave no openings more than one inch wide.
- Floor openings (>12 inches) into which an employee can accidentally walk must be guarded by standard railings and toe boards.
- Open-sided floors, platforms and runways higher than four feet must be guarded by standard railings.

- √ **Standard railings** consist of a top rail, mid rail and posts. The vertical height is 42 inches and the midrail 21 inches.

- Toe boards must be used wherever people can pass below or hazardous equipment or materials are below the work surface.
  - √ **Standard toeboards** are four inches with no more than ¼ inch clearance from the floor level.
  - √

Skylight floor openings and holes must be guarded by a standard skylight screen or fixed standard railing.

47.2.4 Floor Loading Protection

- Loads approved by a building official need to be marked on plates and securely affixed in a conspicuous place, where related.
- No load greater than approved may be placed on the floor or roof.

47.3 Stairways

47.3.1 Stairway Railings and Guards

- Stairs with four or more risers must have standard stair railings, which are between 30 and 34 inches high.
- On stairways <44 inches wide having both sides enclosed, at least one handrail must be affixed.
- On stairways <44 inches wide with one open side, at least one stair rail must be affixed on the open side.
- On stairways <44 inches wide having both sides open, two stair rails, one for each side, must be provided.
- On stairways >44 inches, but <88 inches wide, one handrail on each enclosed side and one stair rail on each open side must be provided.
- On stairways ≥88 inches in width, one handrail on each enclosed side, one stair rail on each open side and one intermediate stair rail in the middle of the stairs must be provided.
  - √ **Standard Stair Railing** - similar to standard railing, but with a vertical height ≤34 inches or ≥30 inches.
  - √ **Standard Handrail** - lengthwise member mounted directly on a wall or partition by means of brackets attached to the lower side of the handrail in order to keep a smooth, unobstructed surface along the top and both sides of the handrail.

47.3.2 Fixed Stairs

- Are provided where access from one structure level to another is necessary on a regular basis or where tools and equipment must be carried.
- Are designed to carry a load of ≤1000 pounds or five times the anticipated live load.
- Are ≥22 inches wide.
- Are installed at an angle of 30° to 50°.

- Treads are slip-resistant with non-slip nosings. If welding bar grating without nosings, the leading edge must be readily identifiable and the tread serrated or non-slip.
- Riser height and tread width must be uniform.

47.3.3 Stairway Platforms

- Must equal the width of the stairway and be a minimum of 30 inches long in the direction of travel.
- Standard railings must be provided on all open sides of exposed stairways and platforms.
- Vertical clearance above any stair tread to an overhead structure is to be less than or equal to seven feet measured from the leading edge of the tread.

47.4 Wall Openings / Holes

47.4.1 General

- If there is a drop greater than four feet through a wall opening, it must be guarded by a barrier, door, railing, etc.
  - √ **Wall hole** - an opening <30 inches but >1 inch of a width in any wall or partition.
  - √ **Wall opening** - an opening ≥30 inches high and 18 inches wide, in any wall or partition through which a person may fall.

47.5 Recordkeeping

47.5.1 Records Retention

Record	Maintained By	Retention
Inspections *	**Principals and Facility Supervisors**	**12 Months**

**See Monthly Inspection Report*

Section 48: Welding Safety

48.1 Introduction

Since welders can be exposed to harmful ultraviolet and infrared light, burns, toxic fumes and gases, electrical shock and fires or explosions, it is essential that extreme care must be used when performing such operations. It is important that only authorized, trained personnel be permitted to use welding, cutting or brazing equipment. All operators must have a copy of the appropriate operating instructions and be directed to follow them.

29 CFR 1910.251-255

48.2 Safe Work Procedures - All Welding and Cutting Operations

48.2.1 Ventilation

- Adequate ventilation must be provided to protect the welder and others from smoke and fumes.
- The air movement needs to be sufficient to prevent accumulation of toxic fumes or possible oxygen deficiency.
- An exhaust system is necessary to keep toxic gases and fumes below the prescribed permissible exposure limits (PELs), especially if welding or cutting metals such as galvanized steel or metal painted with lead bearing paint, which could include zinc, brass, bronze, lead, cadmium or beryllium.

48.2.2 Fire Safety

- Fire extinguishers must be provided. It is recommended that at least one 20 pound dry chemical fire extinguisher be available to the welder at the job site.
- If no safety shower is within 15 to 20 feet of the job, a water hose, fire blanket or fire extinguisher must be provided.
- Use welding shields, curtains or partitions to protect other employees from arcs, sparks and fumes.

- If welding or cutting in an elevated area, a fire watcher needs to be assigned to see where sparks and slag are falling. The area below needs to be either roped off or protected by warning signs.
- All combustible floors are to be kept wet, covered by damp sand, or protected by fire-resistant shields.

48.2.3 Special Precautions

- Do not weld in areas where open flames are not normally permitted, i.e., in areas or on equipment where oxygen, flammable gases or liquids, or chemical vapors may be present.
- It may be necessary to shut down equipment and isolate and tag process lines. Lines or equipment may need to be purged before beginning hot work.

- Do not weld, cut, or perform other hot work on used drums, barrels, tanks or other containers until they have been cleaned and it is certain that no flammable materials or substances are present that will produce toxic vapors when exposed to heat.
- Disconnect and blank any pipe lines or connections to vessels.

48.3 Electric Welding Machines

48.3.1 General Requirements

- All equipment must be installed by a *qualified electrician* in conformance with the *OSHA Electrical Standard, Subpart S*.
- The welding machine must be equipped with a power disconnect switch which is located at, or near the machine so power can be shut off quickly.
- Do not operate the range switch under load. The range switch which provides the current setting is to be operated only while the machine is idling and the current is open. Switching the current while the machine is under a load will cause an arc to form between contact surfaces.
- The open circuit (no-load) voltage of arc welding and cutting machines must be as low as possible and may not exceed recommended limits.
- Under wet conditions, automatic controls for reducing no-load voltage must be used. Hands and clothing need to be kept dry.
- Do not overload welding cables or operate a machine with poor connections. Operating with currents beyond the rated cable capacity may cause overheating. Poor connections may cause the cable to arc when it touches metal grounded in the welding circuit.
- Do not change the polarity switch when the machine is under a load. Wait until the machine idles and the circuit is open. If not, the contact surface of the switch may be burned and the person throwing the switch may receive a severe burn from arcing.
- It is recommended that the grounding of the machine frame and safety ground connections of portable machines be checked periodically. Stray current may develop which can cause severe shock when ungrounded parts are touched.
- Electrodes must be removed from the insulated holders when not in use.

- Shut off all electric power to the welder if leaving unattended.

48.4 Arc Welding Safety

48.4.1 General Safety

- Do not weld in damp areas and keep hands and clothing dry.
- **NEVER** look at an arc with the naked eye, this can cause damage to the cornea.
- To avoid burns, never pick up pieces of metal that have just been welded or heated. Wear leather work gloves, if necessary.
- Always inspect cables for cuts, nicks or abrasions.
- Do not strike an arc if someone without proper eye protection is nearby. If other employees must work nearby, the welding area needs to be partitioned off with a fire retardant screen or curtain to protect them from welding flash.

- Prevent welding cables from coming into contact with hot metal, water, oil or grease.
- Avoid dragging cables over or around sharp corners.
- Keep cables orderly to eliminate tripping hazards.
- Bystanders must not watch the welding arc or expose themselves to its rays or to hot metal. Be aware of reflective surfaces nearby that can reflect the arc light.

48.4.2 Personal Protective Equipment

- **The following protective equipment must be worn when arc welding**:
  1) Welder's hood with correct ANSI standard filters and cover plate:
     - Shade 10 for arc cutting and welding 75 to 200 amps;
     - Shade 12 for arc cutting and welding 200 to 400 amps;
     - Shade 14 for arc cutting and welding over 400 amps.
  2) Goggles or safety glasses to protect from slag popping off the weld or when removing slag.
  3) Gauntlet-type leather gloves to protect from ultraviolet rays and spattering hot metal.
  4) Welder's apron if spattering metal may cause injury. If not, fire retardant coveralls are recommended.
  5) A leather jacket or coveralls may be necessary to protect the arms and body from radiation, sparks and slag particles.
  6) Clothing needs to be dark and heavy enough to protect from infrared and ultraviolet rays.
  7) Cuffs need to be turned down to eliminate catching falling molten metal.
  8) Sleeves need to be long and kept buttoned, along with shirt collars.
  9) Leather steel-toed boots are required if there may be dropping slag or falling objects.
  10) It is recommended that contact lenses NOT be worn when welding. The lenses rest on the fluid of the eyes and there is a possibility that particles, fumes or gases could be lodged between the eye and lens.

48.5 Gas Welding and Cutting Safety

48.5.1 General Safety

- Keep oxyacetylene equipment clean, free of oil and in good condition.
- Avoid oxygen and acetylene leaks.
- NEVER interchange hoses.
- Avoid dragging hoses over greasy floors.
- Purge oxygen and acetylene lines before lighting the torch.
- Never use matches to ignite the torch, always use a striker.
- Keep heat, flame and sparks away from combustibles and always keep a fire extinguisher nearby.
- Handle oxygen and acetylene cylinders with care. Never expose to excessive heat.
- Be sure the adjusting screw on a regulator is fully released before opening a cylinder valve.
- Open cylinder valves slowly.
- Always hang a torch up when not in use to prevent dropping to the floor and being bent or damaged.

48.5.2 Personal Protective Equipment

- **The following protective equipment must be worn when gas welding and cutting:**
  1) Goggles or safety glasses with sideshields to protect from light and heat rays, with suitable shaded lenses, usually 4, 5 or 6.
  2) Suitable clothing to protect from sparks must be worn. (Never wear flammable garments such as sweaters, etc.)
  3) Cuffs need to be turned down to eliminate catching falling molten metal.
  4) Sleeves need to be long and kept buttoned, along with shirt collars.
  5) Leather steel-toed boots are required if there may be dropping slag or falling objects.
  6) Leather aprons, leggings and sleeves are recommended for very hot work.
  7) Non-flammable head protection needs to be worn, if necessary, for protection from sparks.

48.5.3 Welding Gas Cylinders

- Compressed gas cylinders are to be examined monthly for obvious signs of defects, deep rusting or leakage. See the *Compressed Gases Section* for additional information.
- Use care in handling and storing cylinders, safety valves, relief valves, etc. to prevent damage.
- Precautions must be taken to prevent a mixture of air or oxygen with flammable gases, except at a burner or in a standard torch.
- Only approved apparatus (such as torches, regulators pressure-reducing valves, acetylene generators and/or manifolds) may be used.
- Never crack a fuel-gas cylinder valve near sources of ignition.
- Red is used to identify the acetylene and fuel-gas hose, green is for the oxygen hose, and **black** is for inert gases and air.
- All pressure-reducing regulators must be used only for the gas and pressures for which they are intended. Gauges on oxygen regulators need to be marked "USE NO OIL".

- Signs reading "DANGER - NO SMOKING, MATCHES OR OPEN FLAMES", or equivalent must be posted in areas where flammable cylinders are stored.

48.6 Respiratory Protection

If ventilation does not ensure that employee exposure is less than the permissible exposure limits (PELs), respirators may be necessary to prevent inhalation of hazardous fumes and gases. Recommendations for the proper respiratory protection can be found on the MSDSs for the materials that are being welded as well as the rods and fluxes that are being used in the process. Read these carefully and use the suggested protection. Special care needs to be taken when welding or cutting materials painted with protective coatings or lead bearing paint, which may include the following:

- **Zinc**
- **Brass**
- **Bronze**
- **Lead**
- **Cadmium**
- **Beryllium**

See the *Respiratory Protection Section* of this Plan for additional information.

48.7 Recordkeeping

48.7.1 Records Retention

Record	Maintained By	Retention
Manufacturer's Operating Instructions and Manuals	**Facility Administration**	**Duration of Equipment Use**
Training	**Environmental Health and Safety Office**	**Most Current**
Inspections*	**Supervisors**	**12 months**

*See Monthly Inspection Report**

Section 49: Workplace Violence

49.1 Introduction

The School Board of Brevard County will make every effort to provide a workplace safe from the risk of physical assault and/or violence. In order to meet this goal it is important that steps be taken to not only prevent workplace violence incidents, but also to provide the information necessary to deal with such an incident should it occur. The following procedures are intended to reduce employee exposure to such incidents, as well as to provide guidance should there be a workplace violence occurrence.

The Critical Incidence Manual should be referenced and the Public Safety Office informed of any concerns at 633-1000, Ext. 233.

It is important that all employees understand that violence in the workplace will not be tolerated.

49.2 Responsibilities

49.2.1 Principals and Facility Managers, or their Designees

- Ensure that employees are aware of the contents of this Section and the proper procedures for reporting potentially violent situations.
- Maintain open, two-way communication between employees and management and encourage reporting of physical and/or verbal threats.

- Provide training and/or information to managers, supervisors and employees, as necessary, to aid them in recognizing and dealing with potentially violent situations.
- Ensure that all employees know about the Employee Assistance Program (EAP) and how to contact them.

49.2.2 Employees

- Report all threats or perceived problems, observed incidents or any situation that might signal danger or the potential onset of violence.

49.3 Risk Factors

49.3.1 Workplace Violence

Includes acts of physical assault, the threat of physical assault or threats to destroy property.

A *threat* may include behavior that displays a potential for violence, such as throwing things, destruction of property, etc., as well as any behavior that indicates that there is emotional distress.

49.3.2 Types of Workplace Violence Include:

Violent employees.
A violent act by someone with a workplace relationship (former employee, spouse, etc.).
A violent act by a citizen who utilizes the School Board's services.
An attack by an assailant who has no workplace relationship (robbery, assault, etc.).

49.3.3 Employees who may have a greater risk include those who:

Exchange money with the public.
Work alone or in small groups.
Work in high-crime areas.
Work in community settings or homes where there is contact with the public.
Work late night or early morning hours.

49.4 Prevention

The goal of **prevention** is to reduce the frequency, seriousness and impact of workplace violence upon both the employees and School Board of Brevard County operations.

49.4.1 Preventative Measures Include:

- Establishing and enforcing a *Zero-Tolerance of Workplace Violence Policy*, with disciplinary enforcement.
- Prohibiting weapons at the worksite.

- A site assessment for each location should be completed and include:
  - How easy it is to access and move about the facility or workplace;
  - What kind of security systems such as alarms, door locks, etc. are in place;
  - A review of the frequency and severity of prior threatening or hostile situations;
  - Alarm or reporting procedures, their availability and efficiency;
  - How easy it is to access and move about the facility or workplace;
  - A Job Hazard Analysis (JHA) needs to be completed for employees who work alone, away from the worksite or with exposure to the public.
- Establishing procedures for resolving conflicts with employees, such as:
  - Encouraging open communication;
  - Encouraging the reporting of crime, threats and suspicious behavior;
  - Reducing workplace induced stress, if possible (*Excessive workload, pace of work, schedules and interpersonal relationships could lead to workplace violence*);
  - Providing a positive, healthy work environment.
- Ensuring that facilities have procedures set up to control access by:
  - Designating employee and visitor entrances;
  - Locking doors to areas where public access is prohibited;
  - Maintaining separate reception areas;
  - Training those who greet visitors to restrict access.
- Defusing violent reactions from terminated or laid-off employees by:
  - Ensuring that personnel policies and practices are humane and supportive;
  - Providing outplacement assistance;
  - Training Human Resources representatives to recognize potentially violent situations.
- Providing safety instructions to employees who work alone, in isolated areas and/or who may deal with the public, such as:
  - Instructing employees to always be aware of their surroundings and not to enter a location alone if they do not feel it is safe;
  - Maintaining vehicles so that the chance of breakdowns is reduced;
  - Insisting that employees who work away from the site develop a work plan so that someone is aware of their location throughout the day;
  - Instruction on how to avoid confrontational customers or members of the general public.
- Instructing employees to respond to bomb threats or other threats communicated via the telephone using the procedures listed in the *Emergency Procedures* shown in this Plan.

It is recommended that each location practice responding to a workplace violence incident using a simulated event to determine what actions would be necessary and the effectiveness of their procedures. This exercise might indicate a need for changes in the procedures or facility security, or indicate a need for additional training.

49.5 Responding to an Incident

49.5.1 General Actions

- If a violent or threatening situation is developing, employees are to notify a supervisor and/or law enforcement agency **immediately**.
- Contact emergency response organizations, as required (i.e. local fire department, emergency medical services, etc.).

- Management will determine if evacuation procedures are to be initiated (*all employees need to move from the immediate area to a safe place at any threat of violence*).
- A person authorized and properly trained in **crisis management** needs to deal with the violent individual, if such an action is necessary.

49.5.2 Suggestions for Managing Verbal Outbursts

Remain calm and let the person vent.
Ask for specific examples of what has upset the person.
Express concern; offer to help.
Be patient, calm and attentive.
Never get defensive or argue and avoid making threats or issuing ultimatums.

49.5.3 Follow-Up After an Incident

- Provide medical evaluation or treatment to those affected, after an incident
- Arrange post-trauma care for employees, family members and others affected by the incident
- Review and record circumstances of the incident and make recommendations as to how to avoid problems in the future (use the *Accident Investigation Form* if no other form is available)
- Investigate all violent incidents and threats, monitor trends and institute corrective actions.

The Office of Public Safety should be notified of violence AND the action that was taken to remedy and/or report it.

49.6 Training

49.6.1 Training or information should be provided to all employees. Training should include:

Awareness of the potential for workplace violence.
Prevention techniques.
How to deal with angry, hostile and/or threatening individuals.
Awareness of the indicators that could trigger violent acts.
Location of emergency call lists and alarms.
Reporting procedures.
Intercom codes that indicate a security breach or emergency situation, if available.
Evacuation procedures.

49.7 Recordkeeping and Documentation

49.7.1 Documentation

It is essential that violent events, threats and/or unusual behaviors be documented and evaluated and records of the responses and actions taken maintained.

49.7.2 Records Retention

Record	Maintained By	Retention
Site Assessments and Inspections	**District Public Safety Office**	**Most Current**
Incident and Follow-up Reports	**District Public Safety Office**	**Most Current**
Training	**District Public Safety Office**	**Most Current**
Job Hazard Analyses	**Environmental Health and Safety Office**	**Most Current**

Section 50: Workzone Safety

50.1 Introduction

In areas where work must be performed near roadways, effective temporary traffic control needs to be established to provide a safe workzone for employees as well as protection for the general public. The following guidelines are based upon the requirements of the *ANSI Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) and the applicable OSHA standards. At this time, work covered by this Section is performed by contractors, however, Brevard County School Board representatives may review this information with the contractors to ensure compliance.

29 CFR 1926.201 **29 CFR 1926.202** ***Manual on Uniform Traffic Control Devices (MUTCD)***

50.2 Traffic Control Plan (TCP)

- A *Traffic Control Plan* (TCP) needs to be prepared by a person knowledgeable about the principles of temporary traffic control and the work activities to be performed. A TCP describes the traffic controls that are to be used to facilitate traffic through a temporary traffic control zone. It may be very simple or detailed, dependent upon the complexity of the situation. Consider the following:

√ *Duration and Type of Work Activities*
- **Long-term stationary** - occupies location for more than 3 days
- **Intermediate-term stationary** - overnight, up to 3 days
- **Short-term stationary** - daytime, occupies location from 1 to 12 hours
- **Short duration** - up to 1 hour
- **Mobile** - work that moves continuously or intermittently

√ *Location of Work*
- **Outside of the shoulder edge** - work greater than 15 feet from the edge of the shoulder
- **On or near the shoulder edge**
- **On median of divided highway**
- **On the traveled way** - where traffic moves

√ *Roadway Type*
- **Rural two-lane roadways**
- **Urban arterial roads**
- **Other urban streets**
- **Rural or urban multi-lane divided and undivided highways**
- **Intersections**
- **Freeways**

√ *Pedestrian Safety*
- When developing the *Traffic Control Plan*, it is important to consider the safety of any pedestrians who must move around or through a worksite

NOTE: **The *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) gives specific examples and diagrams for the setup of temporary traffic control zones.**

Section 50: Workzone Safety

50.3 Traffic Control Zone

- There are four areas included in a temporary traffic control zone:
  1) **Advance Warning Area** - where drivers are informed of what to expect ahead. May include a sign, a series of signs or flashing lights on a vehicle.
  2) **Transition Area** - where traffic is redirected to a new path. This redirection needs to occur at the beginning of the transition area.
  3) **Activity Area** - where the work actually takes place and includes:
     - √ *Work Space* - portion of roadway closed to traffic and set aside for workers' equipment and material;
     - √ *Traffic Space* - portion of the roadway in which traffic is routed through the activity area;
     - √ *Buffer Space* - spaces in the activity area that separate traffic flow from work activity and which provide a recovery space for a wayward vehicle.
  4) **Termination Area** - extends from the downstream end of the work area approximately 500 feet. "END ROAD WORK" signs may be posted. Used to transition back to normal traffic path.

50.4 Tapers

- Tapers are used to move traffic out of or into its normal path. They are created by using a series of channelizing devices or pavement markings placed to indicate the path to follow and may be used in both the transition and termination areas.
- The length of the taper depends on the type of taper necessary and the speed of the traffic. These factors need to be considered when developing the *Traffic Control Plan* and the appropriate section of the MUTCD referenced.
- The maximum distance between devices used to designate a taper is determined by the distance in feet of the speed in miles per hour (55 mph = space about 55 feet apart).

50.5 Detours

- If it is necessary to direct traffic to an alternate roadway in order to bypass the temporary traffic control zone, signs must be posted over the entire length of the detour so that it is easy for the motorists to return to the original roadway.

50.6 Traffic Control Devices

The purpose of these devices is to warn and alert drivers of conditions created by work activities in or near the traveled way, to protect employees in the temporary traffic control zone (TPC) and to guide drivers and pedestrians safely.

These devices may include: signs, signals, markings, cones, tubular markers, vertical panels, drums, barricades, temporary raised islands and barriers. Some examples of traffic control devices are identified in this Section, however, it is recommended that the MUTCD be consulted for the device appropriate for each worksite.

50.6.1 Signs

- *Regulatory Signs*
  - Inform about traffic laws or regulations.
  - Must conform to the requirements found in the Department of Transportation's "*Standard Highway Signs*".
  - In addition to posting temporary regulatory signs, it may be necessary to cover the permanent signs in a traffic control zone, if the regulatory measures are different than the requirements of the temporary traffic control zone.

- *Warning Signs*
  - Notify drivers of general or specific conditions on or near the roadway.
  - Are diamond-shaped with a black symbol and orange background.
  - Advance warning signs are required where any part of the roadway is obstructed or closed.
  - Placement is determined by roadway type and speed as shown below:

Road Type	Distance Between Signs (In Feet)		
	A	B	C
Urban (low speed*)	**200**	**200**	**200**
Urban (high speed*)	**350**	**350**	**350**
Rural	**500**	**500**	**500**
Expressway/Freeway	**1,000**	**1,600**	**2,600**
Speed category determined by State highway agency.			
	"A" = sign nearest the transition or point of restriction.	**"B" = next sign upstream of the transition or restriction.**	**"C" = first sign in a 3 sign series that the driver encounters in a temporary traffic control zone.**

At maintenance, minor road work and utility sites, in low traffic areas, the sequence for advance warning signs may not be necessary.

- *Guide Signs*
  - Required to give drivers information that will help them with temporary changes due to the traffic control zone setup.
  - The following guide signs are required at temporary traffic control zones:
    - √ Temporary route changes
    - √ Directional signs
    - √ Special information signs relating to the work being done
  - Length of work signs, such as "Road Work Next 5 Miles," are to be erected in advance of any traffic control zone that is longer than two miles.
  - The "End Road Work" sign needs to be placed 500 feet past the work area.
- *Portable Changeable Message Signs*
  - Their primary purpose is to advise the driver of unexpected traffic and routing situations. Usually used on high-density, urban freeways where:
    Speed of traffic is expected to drop substantially;
    Where significant delays and traffic are expected;
    Where adverse environmental conditions are present;
    Where there are changes in alignment or surface conditions;
    To provide advance notice of ramp, lane or roadway closures;

For accident or incident management.

50.6.2 Arrow Displays

- Their purpose is to provide additional warning and directional information to assist in merging and controlling traffic through or around a temporary traffic control zone.
- Different modes and displays are available and the appropriate one (see the MUTCD) needs to be selected for each temporary traffic control situation.

50.6.3 Channelizing Devices

- Used to warn and alert drivers of conditions created by work activities in or near the roadway, to protect employees in the temporary traffic control zone and to guide drivers and pedestrians safely.
- Must provide for smooth and gradual traffic movement from one lane to another, onto a bypass or detour, or reduce the width of the traveled way. They may also be used to separate traffic from the work space, pavement drop-offs, pedestrian paths or opposing directions of traffic.
- They include: cones, tubular markers, vertical panels, drums, barricades, temporary raised islands and barriers.
- *Cones*
  - Used to channelize traffic, divide opposing traffic lanes, divide traffic lanes when two or more are kept open in the same direction and delineate short-duration maintenance and utility work.
  - Must be orange or predominately orange.
  - Minimum 18 inches high (28 inches on freeways and high-speed highways greater than 45 mph) and of a material that can be struck without damaging a vehicle.
  - If used at night, must be reflective or equipped with lighting devices.

- *Tubular Markers*
  - Used to divide opposing traffic lanes, divide traffic lanes when two or more are kept open in the same direction and delineate edge of pavement drop-off where there is no room for larger devices. (SHOULD ONLY BE USED WHERE SPACE RESTRICTIONS DO NOT ALLOW THE USE OF MORE VISIBLE DEVICES)
  - Must be orange or predominately orange.
  - Minimum 18 inches high (28 inches on freeways and high-speed highways greater than 45 mph) and of a material that can be struck without damaging the vehicle.
  - If used at night, must be reflective.
- *Vertical Panels*
  - Used to channel traffic, divide opposing traffic lanes, divide traffic lanes or in place of barricades if space is limited.
  - Must have orange and white stripes and be retroreflective.
  - Must be 8 to 12 inches wide and 24 inches high.
  - Back to back panels must be used for two-way traffic.
- *Drums*

- Commonly used to channelize traffic flow, but may be used to mark locations. Generally used in locations where they will remain for long periods of time.
- Constructed of lightweight, flexible and reformable materials.
- Must have orange and white reflective stripes.
- Minimum 36 inches high and 18 inches wide.
- STEEL DRUMS MAY NOT BE USED.

- *Barricades*
  - Used to control traffic by closing, restricting or delineating all or a portion of the right-of-way.
  - May be portable or fixed, with 1 to 3 rails and come in Types I, II and III:
    - **Type I** - normally used on conventional roads, urban streets, etc. (one rail)
    - **Type II** - intended for use on expressways and high-speed (greater than 45 mph) roads (two rails)
    - **Type III** - normally used for road closures;
  - Signs may be erected on barricades (three rails).
  - Stripes on rails must have alternating orange and white reflective stripes.
  - Minimum rail length is 24 inches.

50.6.4 Lighting Devices

- Used to warn/alert drivers of conditions created by work activities in or near the roadway, to protect employees in the temporary traffic control zone and to guide drivers and pedestrians safely:
  - **Floodlights** - used during nighttime work to illuminate flagger stations, equipment crossings, etc.
  - **Flashing Identification Beacons** - used at points to alert drivers' attention to special conditions. Need to operate 24 hours a day.
  - **Steady-Burning Electric Lamps** - Series of low-wattage yellow electric lamps. Used to mark obstructions and to delineate the traveled way through and around obstructions in a temporary traffic control zone.

  - **Warning Lights** - Used to supplement reflectorization on hazard warning devices:
    - **Type A** - low intensity - commonly mounted on barricades, drums, vertical panels or advance warning signs to warn of an approaching hazardous area.
    - **Type B** - high intensity - commonly mounted on advance warning signs or independent supports. NOT USED FOR DELINEATION. Operate 24 hours per day for extremely hazardous conditions.
    - **Type C** - steady burn lights - used to delineate the edge of the traveled way on detour curves, lane changes, closures, etc.

50.6.5 Other Devices

- *Impact Attenuators*
  - Used to reduce the effects of errant vehicles that strike hazards. May decelerate, stop or redirect the vehicle.

- *Example: Truck-Mounted* - trucks or trailers are often used to protect employees or equipment. These vehicles are normally equipped with flashing arrows, changeable message signs and/or flashers. They must be located in advance of the employees and equipment. Always set the parking brake and turn the front wheels away from the worksite toward a safe area, if possible.

50.7 One-Lane/Two-Way Traffic Control

- If traffic, which is traveling in opposite directions, must use a single lane to bypass a temporary traffic control zone, a means of coordinating movement of traffic at each end needs to be implemented.
- This may be accomplished by using:
  1) **One or Two Flaggers** who control the traffic movement using STOP/SLOW paddles or flags.
  2) **A Flag Transfer Method** - if the route is well-defined and the route is less than one mile, the flag (or other token) may be given to the last vehicle entering the one-lane section with instructions to give it to the flagger at the opposite end. Upon receipt of the red flag, the flagger knows it is safe to allow traffic to move in the other direction.
  3) **A Pilot Car** - a car is used to guide a string of vehicles through a complex temporary traffic control zone or detour. This activity must be coordinated with flagging operations. If used, the pilot car must have the name of the contractor or the contracting authority prominently displayed and the "PILOT CAR" sign must be mounted on the rear of the vehicle.
  4) **Temporary Traffic Signals** - Usually used on highway or street intersections with a temporary haul road or equipment crossing through areas requiring alternating one-way traffic operations.
  5) **Stop or Yield Control Method** - A yield or stop sign may be installed on low-volume, two-lane roads where one side of the roadway is closed and the other side must serve both directions. The side that is open needs to yield or stop for oncoming traffic on the side that is open.

50.8 Hand-Signaling

Flaggers must be used in areas where signs, signals and barricades will not provide adequate protection for employees and the public.

50.8.1 Flaggers

50.8.1.1 One Flagger

- Flaggers are responsible for protecting employees and providing those who must travel through the areas where the work is being done with safe, courteous and authoritative directions.

- Those selected to perform flagger duties must be certified as ***required by the State of Florida***, trained in safe traffic control practices, physically able to perform the duties and mentally alert.
- Flaggers must handle traffic only, and are not permitted to perform other work. When a break is required, notify a supervisor so that a replacement can be found.
- *Clothing*
  - Flaggers must be provided and wear a red or orange warning vest or other highly visible garment while flagging and if worn at night must be made of retroreflective material.
  - The State of Florida requires that flaggers wear hardhats.
- *Tools*
  - Paddles must be provided with the combination 'STOP/SLOW". They must be 18 inches wide and the letters must be at least six inches high and reflective if used at night.
  - If night-time flagging, a red warning light illuminated by a flashlight or other device must be used. The flagging station must be well lighted.
  - In emergencies, or if a one-flagger station is used, a 24 inch square red flag, on a three foot pole may be used.
- *Position of Flagger*
  - Always face oncoming traffic.
  - Stand in a highly visible location, out of the direct path of approaching vehicles.
  - Flagger stations need to be about 200 feet (but not less than 100 feet) in advance of the work area.
  - Consider visibility, speed and traffic before establishing the station.

50.8.1.1 One Flagger – Continued

- *Stopping Traffic*
  - Hold the "STOP" sign erect and away from the body or if using a flag, hold it at a right angle. *Do not wave the paddle or flag.*
  - Remain in this position with the "STOP" sign facing traffic until you can permit travel safely through the workzone.
  - When flagging at night, wave a flashlight or lantern in a semi-circle arc in order to attract a driver's attention.
  - NEVER turn your back on traffic or stand in the path of a vehicle!

- *Releasing Traffic*

A) **Releasing Traffic into Left Lane - One Way Traffic**
  - Stand to the front and right of stopped traffic, turn the "SLOW" side of the sign to face the vehicles and, with your free arm, signal the drivers to proceed in the left lane. NEVER WAVE THE SIGN.
  - After all vehicles have passed, return to the shoulder to await the next vehicle.

B) **Releasing Traffic into Right Lane - One Way Traffic**
  - Return to position on the shoulder, display the "SLOW" sign, and, with your free arm, signal the drivers to proceed.

C) **Releasing Traffic on Right Lane - Two Way Traffic**

  - When traffic is stopped temporarily in only one lane for operations, such as loading or unloading, hold the sign with the "STOP" facing you so that the approaching motorists cannot read it. To release the stopped traffic, initiate movement with a positive motion.
- *Slowing Traffic*
  - Show the "SLOW" side of the paddle and motion with your free hand for motorists to proceed. Operate from the shoulder of the road if no approaching traffic lanes are closed

50.8.1.2 Two Flaggers

- If there is a flagger working at each end of the work area, they must either be able to see each other or maintain contact through the use of two-way radios.
- One flagger must be the leader of the flagging team.
- A single flagger may be used for minor work, where the length of the work area is short and where traffic from either direction can easily see the flagger; but in any other conditions, two flaggers, one at either end must be used.

50.8.1.3 Advance Flagger

- If there is limited sight distance to the work area or if traffic volume is such that the distance between the first and last vehicle is great, an advance flagger may be used.
- The advance flagger will stop each vehicle as it approaches and advise the driver of the work ahead and actions he/she should take, such as "keep to the right", "stay in line," etc.

50.9 Training

All employees who participate in any aspect of temporary traffic control zone safety must receive training appropriate to their level of participation. (The Central Florida Safety Council's *Maintenance of Traffic Class* meets this requirement.)

50.9.1 Supervisors

- Those who develop traffic control plans (TCPs) and/or supervise the selection, placement and/or maintenance of traffic control devices must:
  - Be trained in safe traffic control practices.
  - Understand the applicable standards and regulations.
  - Understand the requirements of the MUTCD.

50.9.2 Flaggers

- Must be trained in all requirements found within the *ANSI D6.1-1971 Manual on Uniform Traffic Control Devices for Streets and Highways* that pertain to their duties as flaggers.
- This training is required by the State of Florida. Flaggers must be certified to perform such duties.

50.10 Recordkeeping

50.10.1 Records Retention

Record	Maintained By	Retention
Training/Certification*	**Environmental Health and Safety**	**Most Current**

*Employees do not perform this work, therefore training/certification would only be required if the duties are to be performed in the future.