

# FACILITIES AND ELECTRICAL SAFETY

## **PURPOSE**

This policy has been established to comply with the Davie County Safety Policy and to meet the OSHA requirements. The purpose of this plan is to ensure that all facilities of the Davie County are safe and that employees use work workplace procedures that reduce the risk of injuries or illnesses.

## **INFORMATION SOURCES**

The North Carolina Occupational Safety and Health Standard for General Industry from the North Carolina Department of Labor is the primary source for these regulations. Other sources include the following NC- OSHA General Industry Digest ([http://www.osha.gov/Publications/osha\\_2201.pdf](http://www.osha.gov/Publications/osha_2201.pdf)) for the following: Machine Safeguarding, Electrical Safety, Personal Protective Equipment, Safe Handling of Materials, Lockout /Tagout, Eyewash and Safety Shower Facilities, Corrosive Substances, and Fall Prevention. A hard copy of this Digest is located in the Safety Manual Master located in the County Manager's Office. The OSHA Safety and Health Management Systems Checklist is an additional source of information.

## **RESPONSIBILITIES**

The Safety Committee for Davie County has the responsibility for coordinating the facilities safety program.

The Safety Committee will plan comprehensive safety inspections of all facilities at least annually. The results will be documented and forwarded to Department Directors.

Each Department Director is responsible for ensuring that all employees are knowledgeable and compliant with requirements for facilities safety and for monitoring compliance as described by this plan.

Employees are responsible for using safe work practices and for reporting any unsafe conditions to their Director, Supervisor, or departmental Safety Committee Representative.

## **PROCEDURE: ELECTRICAL SAFETY**

Each facility will have an electrical safety program that includes training and education, regular inspections, hazardous condition reporting, safe work practices, and housekeeping.

## **TRAINING AND EDUCATION**

Training will be provided to persons who work on, near, or with electrical hazards that are not reduced to a safe level by the electrical installation. All employees will be trained in and be familiar with the safety related work practices discussed below that pertain to their respective job assignments.

## **REGULAR INSPECTIONS**

Electrical Safety inspections will be conducted in each department annually. The inspection results will be forwarded to the Safety Committee and a copy will be kept in the Safety Manual.

### **HAZARDOUS CONDITION REPORTING**

Unsafe equipment, conditions, or procedures will be reported to the Director or the Safety Committee Representative. Defective electrical equipment that could cause electrical shock will not be used under any conditions. **The equipment will be taken out of service and tagged for repair or disposed of.**

### **SAFE WORK PRACTICES FOR ELECTRICAL SAFETY**

Each employee must be familiar with and comply with OSHA regulations as they apply to workplace safety. The following work practices will be followed:

- Power equipment will be plugged into wall receptacles with the power switches in the off position.
- Electrical equipment will be unplugged by grasping the plug and pulling, never by jerking the cord.
- Frayed, cracked, or exposed wiring on equipment cords will be corrected before using.
- "Cheater plugs", extension cords with junction box receptacle ends, or other jerry-rigged equipment will not be used.
- Temporary or permanent storage of materials will not be allowed within 3 feet of any electrical panel or electrical equipment.
- Any electrical equipment causing shocks or which have high leakage potential will be tagged with a DANGER-DO NOT USE label or equivalent.
- Any electrical splicing will be made using suitable splicing devices or brazing, welding, or soldering with a fusible metal alloy, and then covered with an insulation equivalent to the conductor.
- Branch circuits will be clearly marked to identify their purpose.
- Exposed live electrical parts operating at 50 volts or more will be guarded against accidental contact by approved cabinets or enclosures, by location, or by limiting access to qualified persons.
- Rooms or enclosures containing exposed live parts or conductors operating at over 600 volts, will be kept locked or under the observation of a qualified person at all times.
- Over current devices will be readily accessible, not exposed to physical damage, and not located in the vicinity of easily ignitable material.
- The path to ground from circuits, equipment, and enclosures will be permanent and continuous.
- Plugs for all refrigerators and air conditioners, etc, will be grounded.
- Hand held motor operated tools will be grounded or clearly labeled as double insulated.
- All pull boxes, junction boxes, and fittings will be provided with covers approved for the purpose.
- Flexible electrical cord and extension cords will not be used as a substitute for the fixed wiring of a structure.

- Any electrical wiring and equipment that is located in hazardous locations will be either intrinsically safe, approved for the hazardous location, or safe for the hazardous location; ground fault circuit interrupters (GFCI) will be used when necessary.
- Sufficient working space will be provided to permit safe operation and maintenance of electrical equipment.
- Electrical extension cords will be of the three wire type with a ground plug. Extension cords may be used temporarily for infrequently used equipment. They cannot be used permanently and they will not be stapled or nailed and will not be run through windows, doorways or across walkways.
- Unused openings in electrical boxes will be fitted with blanks.
- Portable electrical heaters of any type are not allowed in county property.

### **HOUSEKEEPING**

Areas around electrical equipment, such as circuit breaker panels, disconnects, and fixed power tools, will be kept free from stored items, debris, and any liquid or material that would create slippery floors or obstruct access to the equipment for maintenance or emergencies. Closets and work areas must be maintained in an orderly manner.

### **PROCEDURE: LOCKOUT/TAGOUT (CONTROL OF HAZARDOUS ENERGY)**

Employees who work on energized equipment involving either direct contact by means of tools or materials must have the following training to become a "qualified person":

- Skills and techniques to distinguish exposed live parts from other parts of electric equipment,
- Skills and techniques necessary to determine the nominal voltage of exposed live parts,
- The clearance distances required and the corresponding distances to which a qualified person will be exposed, and
- Skills and techniques in lockout / tagout to de-energize circuits or equipment.

A contracted, qualified electrician will provide disconnect services. No employee will de-energize equipment.

This energy control procedure will be utilized for control of hazardous energy. Specific procedures include securing machines; placement, transfer, and removal of lockout devices; and testing of locked machinery. Circuits and equipment to be worked on will be disconnected from all energy sources. Control circuit devices are not the sole means for de-energizing. A lock and tag will be placed on each disconnecting means used to de-energize circuits and equipment. The lock will be attached to prevent persons from operating the disconnecting means unless they resort to undue force or the use of tools.

Each tag will be durable, standardized, and identifiable and will contain a statement prohibiting unauthorized operation of disconnecting means or removal of the tag. If a lock cannot be applied a tag may be used without a lock if it is supplemented with one other safety measure such as removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

A lock can be placed without a tag only under the following conditions:

- Only one circuit or piece of machinery is de-energized,
- The lockout period does not extend beyond the work shift,
- Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure. A qualified person will verify the de-energized condition by attempting to operate the equipment or by using testing equipment to test the circuit elements or electrical parts of the equipment.

Re-energizing of the equipment will follow this procedure:

- 1) A qualified person will conduct tests and a visual inspection to verify that tool, electrical jumpers, shorts, and grounds have been removed,
- 2) Employees exposed to hazards of reenergizing will be warned to stay clear,
- 3) Each lock and tag will be removed by the employee who applied it or under his/her direct supervision,
- 4) A visual determination will be made that all employees are clear of the circuit or equipment,
- 5) Circuit or equipment will be reenergized.

## **PROCEDURE: ENVIRONMENTAL CONTROLS**

Procedures for ventilation, noise control, general environmental controls, and materials handling and storage are included in this section.

### **VENTILATION**

- The ventilation system will adequately remove vapors and gases from hazardous working environments.

### **GENERAL ENVIRONMENTAL CONTROLS**

- Trash cans must be emptied regularly and will have tight fitting covers when trash contains hazardous or odorous substances.
- Non-potable water sources will be marked as such with color coding. Toilet facilities will be accessible and labeled as such.
- Eating is not allowed in toilet areas and in areas exposed to toxic or hazardous materials.

### **MATERIALS HANDLING AND STORAGE**

- Aisles and passageways are kept clear.
- Materials will be securely stacked when stored and aisles will be maintained when materials are stored on floors.
- Good housekeeping will be maintained in storage areas.
- Only trained and authorized drivers will be permitted to operate powered industrial trucks. The Staff will ride on powered industrial trucks only when provided a safe place to ride.

**PROCEDURE: FIRST AID/MEDICAL**

First aid and medical services will be available to all county employees. The Wake Forest Baptist Healthcare Center—Davie and the Davie Medical Center-Bermuda Run are recommended medical facilities located within the county and approximately a 15 minute drive or less.

First aid supplies will be readily available at each facility and will be replenished after use. The Lab in the Health Department, Water Plants and Sewer Plants will be equipped with quick-drenching eye wash stations that will provide a steady flow of water for 15 minutes since hazardous / corrosive materials are used in these locations.

Potable drinking water and adequate toilet facilities will be available at construction sites.

**PROCEDURE: HAND AND PORTABLE POWER TOOLS**

Davie County will ensure that all hand power tools and portable equipment is in a safe condition and properly equipped with safety devices. These procedures include the following: 1) Powered Hand Tools, and 2) Mowers.

**POWERED HAND TOOLS**

All hand-held circular saws with blade diameters greater than 2 inches, all chain saws, and all powered hand tools will have a constant pressure power switch that will shut off when the pressure is released. All hand-held disc sanders with discs greater than 2 inches in diameter, belt sanders, reciprocating saws, and saber, scroll, and jig saws with blade shanks one quarter of an inch (1/4) or greater in width, along with other similar tools, will have a constant pressure power switch or a switch that may be turned off in a single motion with the same finger that turned the tool on. All other tools may have either a pressure switch or a standard on/off switch.

Belt sanders will be equipped with guards that will prevent the operator's hands from touching the nip points where the belt comes in contact with the pulleys. Circular saws will have guards that will cover the saw the depth of the teeth and shall return to completely cover the saw as it is withdrawn from the work. All portable grinders will be equipped with guards that will cover the spindle end, nut and flange projections. These guards will also allow no more than 180° of the abrasive surface to be exposed and will be located between the operator and the wheel during use. Any piece of machinery that is not properly guarded will not be used under any conditions.

Grinding wheels will fit freely on the spindle and will maintain a controlled clearance between the wheel hole and the machine spindle. Immediately before mounting, all wheels shall be closely inspected and sounded by the user (ring test) to make sure they have not been damaged in transit, storage, or otherwise. A process for conducting this inspection is outlined in Subpart O OSHA 1910.215(d) (1). The spindle speed of the machine shall be checked before mounting of the wheel to be certain that it does not exceed the maximum operating speed marked on the wheel. Wheels should be tapped gently with a light nonmetallic implement, such as the handle of a screwdriver for light wheels, or a wooden mallet for heavier wheels. If they sound cracked (dead), they shall not be used. This is known as the "Ring Test".

All electrically powered equipment will meet the grounding requirements of 3 prong plug or have double insulated written on the tool. Pneumatically powered tools will be equipped with a tool retainer and will use air hoses that are designed and rated for the pressure they must take.

Any jacks that are used must be rated and that rating must be legibly marked on the jack. Jacks must be rated for a load greater than the load it is expected to support. Jacks must be thoroughly inspected at times depending on their work load. A jack with a heavy workload must be inspected at least every 6 months and repair jacks will be inspected

before and after each use. These inspections will be documented and filed with the departments' Safety Coordinator. All jacks will be kept in good operating condition and will be periodically lubricated. After a load has been jacked, it must be blocked and secured immediately.

### **MOWERS**

All power mowers will meet the requirements of ANSI B71.1-X1968. All power driven belts, chains, and gears must be guarded to protect against accidental contact. A shutoff device will be provided to stop operation in the event of an accident. The words, "Caution - Be sure the operating control(s) is in neutral before starting the engine" or similar wording will appear near the starting controls.

The blade on all power mowers will be guarded and openings will be placed so that the discharge of debris will not be in the direction of the operator. This opening will meet the requirements outlined by OSHA and will have a guard of its own that projects a minimum of three (3) inches away from the blade of a push mower and six (6) inches on a riding mower or it will have a bar permanently affixed that will prevent entry into the opening. The opening will be clearly marked by a warning label.

### **PROCEDURE: MACHINE GUARDING**

Many hazards are created by moving machine parts. Safeguards are essential for protecting county employees from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips, and sparks. Examples of guarding methods include barrier guards, two-handed tripping devices, and electronic safety devices.

All machines whose point of operation (area on machine where work is actually performed upon the material being processed) exposes an employee to injury will be properly guarded.

Belt sanders will be equipped with guards that will prevent the operator's hands from touching the nip points where the belt comes in contact with the pulleys. Circular saws will have guards that will cover the saw the depth of the teeth and shall return to completely cover the saw as it is withdrawn from the work. All portable grinders will be equipped with guards that will cover the spindle end, nut and flange projections. These guards will also allow no more than 180° of the abrasive surface to be exposed and will be located between the operator and the wheel during use. Any piece of machinery that is not properly guarded will not be used under any conditions.

All flywheels, pulleys, horizontal and vertical belt drives, sprocket wheels, and chains within 7 feet of floor level will be properly guarded. All gears will be properly guarded.

### **PROCEDURE: HAZARDOUS MATERIALS**

Hazardous materials are those chemicals or substances that present a physical and/or health hazard. Examples of materials that present a physical hazard are compressed gases, flammable and combustible liquids, and oxidizers. Materials presenting health hazards include toxic materials, radioactive materials, corrosives, irritants, and carcinogens. The following procedures focus on the prevention and control of dangerous conditions created by the presence of hazardous materials.

**The Hazardous Communication Plan also addresses hazardous materials.**

- 1) Compressed gas cylinders will be visually inspected for defects and leaks weekly and will be secured in an upright position.
- 2) Fire extinguishers will be located in areas where flammable liquids are stored or used. Flammable and

combustible liquids are stored in tanks or closed containers.

- 3) Paint with flammable properties will be stored in fire resistant cabinets with conspicuous NO SMOKING signs posted on cabinet.
- 4) Bulk storage of flammable or combustible liquids in portable containers will be located in a separate building (i.e. Chlorine Building).

### **LABORATORIES**

The following will be used for all laboratory work with chemicals:

- For accidents and spills with eye contact, the eyes will be promptly flushed with water for 15 minutes then medical attention will be sought.
- For accidents and spills involving skin contact, the area will be promptly flushed with water and contaminated clothing will be removed.
- If symptoms continue after washing, then medical attention will be sought.
- Spills will be promptly cleaned up using appropriate personal protective equipment and proper disposal.

The following safe work habits are listed below to assist in avoiding unnecessary exposure to chemicals:

- Do not smell or taste any chemical.
- Inspect gloves before use with chemicals.
- Use only chemicals for which the quality of ventilation system is appropriate.
- Avoid eating, drinking, or smoking in laboratory areas.
- Handle and store glassware with care to avoid breakage.
- Wash areas of exposed skin well before exiting the lab.
- Do not use mouth suction for piping.
- Confine long hair or loose clothing and wear shoes at all times.
- Keep work area clean, uncluttered, with chemicals and equipment being properly labeled and stored.
- Use appropriate personal protective equipment at all times.

### **PROCEDURE: WALKING AND WORKING SURFACES**

This policy is to provide protection from the hazards of falling in a working environment. This policy is divided into seven sections: 1) Definitions, 2) General Requirements, 3) Floor and Wall Openings and Holes, 4) Fixed Industrial Stairs, 5) Portable Ladders, 6) Fixed Ladders, and 7) Scaffolding.

## DEFINITIONS

The following definitions explain the OSHA requirements of some items.

**Standard Railing**- are required for stairs with 4 or more risers and will consist of a top rail, intermediate rail, and posts and will have a vertical height of 42 inches nominal from the upper surface of the top rail to the floor. The top rail will be smooth-surfaced throughout the length of the railing and the intermediate railing will be approximately halfway between the top rail and the floor. The construction materials will be strong enough to support 200 pounds of pressure at any point along the upper rail.

**Stair Railing** - will be of similar construction to a standard railing but the vertical height will be not more than 34 inches and not less than 30 inches from the upper surface of the upper railing to the floor surface.

**Standard Toe board** - will be 4 inches nominal in vertical height from its top edge to the floor. It will be securely fastened with not more than one-quarter of an inch of clearance above the floor. It will be made of substantial material with no openings larger than one inch.

**Handrail** -will consist of a lengthwise piece that is directly fastened to wall or partition by means of brackets that connect to the lower side of the rail. The handrail will be easy to grasp and will be no more than 34 and no less than 30 inches in vertical height from the top edge of the railing to the floor. The handrail should be strong enough to support 200 pounds of direct pressure, be at least 3 inches from the wall, and will have no more than 8 feet in between brackets.

**Floor Opening Covers** - will be made of any material that can support the weight requirements and may protect up to one inch from the floor level as long as the edges are chamfered to an angle of no more than 30 degrees and all handles, bolts, etc. are flush with the cover.

**Wall Opening Barriers and Handles** - Barriers will be constructed so that they can support 200 pounds of pressure applied in any direction, except upward. Grab Handles will be no less than 12 inches in length and will have 3 inches of clearance between the handle and the wall. It will be capable of handling 200 pounds of pressure in any direction.

## GENERAL REQUIREMENTS

All places of employment, passageways, storerooms, and service rooms will be clean and orderly. The floor of every workroom will be kept clean and as dry as possible. Where wet processes are employed, drainage and mats should be used as much as possible. All floors, walls, and doors will be kept free of any nails, splinters, holes or loose materials. Aisles and passageways will be kept free of any obstructions. Covers and/or guardrails will be provided to protect personnel from the hazards of open pits, tanks, vats, ditches, etc. There will be a plate, securely affixed to every building, stating the loads approved by the building official for all floors.

## FLOORS AND WALL OPENINGS AND HOLES

Stairway floor openings will be protected by a standard railing and all ladder way floor openings will be protected by a standard guardrail and toe board. Every pit and trap door floor opening will be protected with a sturdy cover. All manhole openings will be guarded by a manhole cover and, when in use, will be constantly attended or protected by removable railings. All other floor holes that someone may walk into will be protected by standard railings or a floor hole cover.

Every wall opening from which there is a drop of 4 feet or more will be protected by a rail, roller, half-door or other barrier or an extension platform with standard railings. If equipment may fall from this opening, then a toe board will also be necessary. All temporary wall openings need protection barricades, but they do not have to be of standard construction.

Open-sided floors with a 4 foot or higher drop to the adjacent floor will have standard railing on all sides except where there is a ramp, stairway, or fixed ladder and will have a toe board when there is a danger of falling equipment. Every runway will be guarded by a standard railing and toe board, when applicable. Regardless of height, all open-sided floors, walkways, platforms, etc. that are above or adjacent to dangerous equipment, degreasing units, galvanizing tanks or similar hazards, will be equipped with standard railings and toe boards.

All flights of stairs with four or more risers will be equipped with standard stair railings or handrails depending on the configuration of the stairs as outlined in the OSHA regulations.

### **FIXED INDUSTRIAL STAIRS**

Stairs will be required where operations necessitate regular travel between levels and for access to operating platforms where regularly attended machinery is located. Stairs will be strong enough to hold 1000 pounds and will be installed at horizontal angles between 30° and 50°. The design and tread run will conform to OSHA guidelines outlined in the regulation.

### **PORTABLE LADDERS**

Ladders must be kept in good working condition and if any section of a ladder breaks, it must be scrapped and not repaired. Broken ladders must be visibly tagged as unsafe and all ladders will be regularly inspected. Any parts of the ladder that show signs of wear must be taken care of. Rungs will be kept clean and will have a skid resistant surface. All portable ladders must have secure footings and skid resistant feet when there is a hazard of slipping.

Portable ladders will have a minimum of 12 inches between side rails and will not extend more than 30 feet in length. Portable ladders are designed to handle one man and a 200 pound load. A simple rule for setting up a ladder at the proper angle is to place the foot of the ladder at a distance from the wall that is one-fourth of the distance being scaled. No ladder will be used to gain access to a roof unless the top of the ladder is extending at least three feet above the level of the roof. All particular types of ladders will meet the OSHA guidelines given in this regulation. Ladders near electrical sources will be of a nonconductive material.

### **FIXED LADDERS**

Fixed ladders are those ladders that are permanently affixed to a wall or structure. These ladders must meet the design characteristics outlined in the OSHA regulations. They must be properly maintained and will have a corrosive resistant coating that will protect the ladder from the elements.

Fixed ladders greater than 20 feet will have cages, railings, or fall arresters to serve as safety devices. These devices must also fit the requirements of OSHA.

### **PROCEDURE: WELDING, CUTTING, AND BRAZING**

The following procedures will be followed by county employees involved in welding, cutting, or brazing to ensure their safety:

- Compressed gas cylinders will be legibly marked, secured in a vertical position, and will have valve protection caps installed on cylinders that will accept them. Oxygen cylinders will be separated from combustible materials by at least 20 feet or by a noncombustible barrier at least 5 feet high and 1/2 hour fire resistant.

- Acetylene cylinder valves will be closed when work is not in progress and opened no more than one and one half turn of the spindle when being used.
- Adequate welding shields, booths, or curtains will be used when appropriate. Well ventilated areas are required to ensure removal of fumes and smoke and keep the concentration within safe limits. Personal protective devices will be used when welding is in progress. Helmets and hand shields will be used by the welder and any attendant will use goggles or helmet.
- Manufacturer's operating rules and instructions for welding equipment will be strictly followed. Welding equipment will be inspected before using and at least monthly by qualified personnel and recorded. Inspection records will be maintained at the Shop.
- Welding cable splices will not come within 10 feet of the holder. Arc welders will be disconnected at the end of operation.
- Only employees trained in safe means of welding and the use of fuel gas will operate welding equipment.
- Fire extinguishing equipment will be available in the work area for instant use. All Public Works staff will be trained in the use of fire extinguishers.
- Used drums, barrels, tanks or other containers will be thoroughly cleansed of flammable materials before welding begins.

## **PROCEDURE: ERGONOMICS AND OFFICE SAFETY**

Ergonomics is the science of fitting the job to the people who work in them. When job demands exceed human capabilities, there is an increased risk for fatigue, discomfort, injury, and a variety of work-related Musculoskeletal Disorders (MSDs). Some basic ergonomics principles will help improve employee comfort and minimize the occurrence of injury.

### **What Are Musculoskeletal Disorders (MSDs)?**

MSDs are injuries and illnesses that affect muscles, nerves, tendons, ligaments, joint or spinal discs. Some common types of MSDs include: Tendinitis, Epicondylitis, Tenosynovitis, Herniated Disc, Trigger Finger, Dequervain's Disease, Carpal Tunnel Syndrome, Hand-arm Vibration Syndrome, Low Back Pain.

### **What Are The Signs And Symptoms Of MSDs?**

Pain, burning or stiffness in joints or muscles; pain in wrists, shoulders, arms, or legs; swelling or inflammation, fingers or toes turning white; back or neck pain; shooting or stabbing pains in arms or legs

### **What Causes MSDs?**

Work-related MSDs can be caused by exposure to these risk factors:

- Forceful exertions (heavy lifting, pushing, or pulling)
- Repetitive motions (frequent bending of joints)
- Awkward postures (extreme bending, stooping, reaching)
- Contact pressure (pressing the body against hard surfaces or edges)
- Operating Vibrating tools

Non-work-related factors can cause MSDs or symptoms. Signs and symptoms similar to MSDs can be caused or aggravated by activities or conditions off the job such as: sports, arthritis, hobbies, pregnancy, smoking, menopause, alcohol consumption, certain medications, diabetes, and many more.

### **Prevention is the Best for Eliminating MSDs**

- Store heavy supplies at a height between knees and shoulders. Use proper lifting techniques for moving heavy supplies or equipment.
- Utilize proper posture when sitting for long periods of time or when lifting and carrying.
- Interrupt repetitive tasks at least every 15 minutes to allow rest to stressed body parts; including computer work.
- Organize work space to allow for best use of body and least amount of stress on one part of the body.
- Turn rather than twist when working.
- Use a telephone head set with extended phone work to allow hands free. Do not hold phone between ear and shoulder.
- Select proper work equipment to support the body such as chairs with firm, padded backs and appropriate height; back belts or hand trucks when lifting heavy objects; etc.

### **Reporting MSD Incidents Or Signs/Symptoms Of MSDs**

Early intervention is essential in controlling MSDs. Report all incidents or sign/symptoms immediately to the Director or supervisor so that prompt evaluation and medical care can be started. Explore ways to prevent or reduce exposure to MSD risk factors.

### ***EVALUATION OF PLAN***

*An inspection to evaluate the implementation of this plan will be conducted in each department annually. Results will be reported to the Safety Committee and to the Department Directors when an area for improvement is identified.*

*The Safety Committee will review inspection results for trends and issues and recommend actions to improve if needed.*