

## **Section One – Safety Committee**

The safety committee is designed to establish lines of communication between the City Administrator, department heads, and employees, and to promote and develop safe working conditions, raise employee consciousness toward safety, organize and implement programs that will provide the safest possible working environment for city employees, help prevent on-job personal injuries, help prevent vehicle accidents, help reduce worker's compensation claims, help reduce vehicle insurance premiums, and provide a safer city for the citizens of Willard.

The committee shall meet monthly and the safety coordinator shall be responsible for designating the date, time and place for each meeting. The membership of the committee is composed of one (1) representative from each department. The members will not be a department head or supervisor. The committee will review all accidents. They will also be responsible for setting guidelines for general safety rules.

## **Section Two – Employee Safety Committee Mission Statement**

- A. To promote and develop safe working conditions
- B. To raise employee consciousness toward safety
- C. To organize and implement programs that will provide the safest possible working environment for city employees
- D. To help prevent on-job personal injuries
- E. To help prevent vehicle accidents
- F. To help reduce vehicle insurance premiums
- G. To help reduce worker's compensation claims
- H. To provide a safer city for the citizens of Willard

## **Section Three – Safety Coordinator**

- A. The safety coordinator's responsibilities relate to the direction and administration of the loss control and prevention program
- B. Act as chairman of the safety committee and schedule meetings and agenda items
- C. Consult directly with all management personnel, employees, and safety committee members
- D. Implement loss prevention activities that incorporate the current practices and philosophies adopted as the most effective in controlling and preventing losses
- E. Prepare summaries of accidents to be submitted to the City Administrator. These reports will consider accident/injury experiences, related costs, causes and trends, problem areas, and overall safety performance.
- F. Ensure follow-up investigations are accomplished in the correction of unsafe conditions or practices identified by the safety committee or the department head
- G. Inform the City Administrator and departments heads of the status of matters affecting the loss prevention program

- H. Periodically evaluate the program within the departments by inspection of facilities and records for compliance.
- I. Maintain an effective driver training and selection program for drivers of municipal vehicles
- J. Coordinate compliance with federal, state and local laws

#### **Section Four – Loss Prevention Policy**

It is the policy of the City of Willard to take all practical steps to safeguard employees and the general public from accidents and to maintain at all times an effective safety program. The safety of our employees must continue to be our first consideration, as our people are our most important asset --- their safety is our greatest importance.

We recognize that more than safety is involved. The existence of accident hazards is proof of a wasteful, inefficient operation. Accidents lead to interference with work plans, public complaints, dissatisfaction, and loss of good will.

Each of us, at all levels in the organization, have the responsibility of doing our part in loss control and the prevention of accidents.

By working safely together, we can help reduce the unnecessary pain of personal injury and the cost of accidents. When each of us does our part, that is when safety pays. Remember, "safety is everyone's job!"

#### **Section Five – Incident/Accident Reporting Procedures**

When employees are injured while on duty, they shall notify their supervisor and the human resource office of the injury. This notification must be done, if at all possible, during the same workday as the injury occurred. The City shall not be responsible for unverifiable injuries. When employees notify their supervisor and the human resource office of their injury, they must complete, in full, an incident/accident report form and a report of injury form. Their forms will need to be completed with proper signatures prior to receiving medical attention, unless the injury is of the emergency nature and medical treatment must be received immediately. After the supervisor has received these forms, the supervisor shall in turn forward the forms to the department head of the employee, the human resource office and the safety coordinator. Whenever possible, the human resource office shall be responsible for arranging all medical treatment.

#### **Section Six – Safety Suggestion Program**

In order to increase safety awareness, the City of Willard has established the following Safety Suggestion Program:

- A. A safety suggestion form and collection box will be rotated between the departments. Each department will have the box for a period of one month before the box is placed in the next department. The safety suggestion box

will rotate in the following order: City Hall, Parts, Public Works, and Police. The representative from each department will be responsible for returning the box in the condition in which it was issued and provide the necessary forms for the department.

- B. Employees' safety suggestions should accomplish one of the following:
  - 1. Prevent accidents
  - 2. Prevent waste
  - 3. Reduce costs
  - 4. Save time
  - 5. Increase productivity
  - 6. Improve quality
  - 7. Improve service
  - 8. Improve morale
- C. Safety suggestions will be reviewed and considered for implementation by the safety committee at their monthly meeting. The Safety Coordinator is responsible for collection of safety suggestions and presenting them to the safety committee.
- D. Employees whose suggestions are used will be recognized for their contribution to the loss prevention program.
- E. Anonymous suggestions are acceptable.

## **Section Seven – Employee Safety Incentive Program**

In the past, most business managers and safety professionals felt it was not feasible to devote money to an incentive program that may or may not be a beneficial activity.

OSHA fines increased 700% on March 1, 1991. Worker's compensation insurance premiums increased 800% from 1985-1995. The potential negative financial impact of these two factors made it very clear that a well thought out incentive program can have a big impact on your organization's bottom line.

Safety Incentive Program goals for the City of Willard are:

- 1. Motivate employees to have ownership of their own actions
- 2. Motivate employees to watch out for their fellow employees in a positive manner
- 3. Provide peer pressure to prevent fraudulent claims

Recognizing that each of our employees has ultimate control and ownership of their working activities and attitudes, we want to reward them for their positive participation in the city safety program.

The criteria for awards is:

<u>Activity</u>	<u>Qtr</u>	<u>Yearly</u>
No incidents	1	4
No lost time accidents	1	4
Offering safety suggestions	1	4
Safety suggestion implemented	1	4
Serving on safety committee	1	2
Total	5	18

Annually, the safety committee shall recommend to the Board of Aldermen an appropriate awards program based on safety point accumulation. Said awards program shall be integrated into the annual operating budget.

### **Section Eight – Inspection of Facilities**

Inspection of buildings and grounds shall be conducted quarterly on a formal basis. The inspections shall be conducted by the safety coordinator and department head.

When inspecting the facilities, two (2) forms shall be used. They are a Building Inspection Checklist and Fire Inspection Checklist. After the inspection, any hazards noted shall be reported to the department head on a completed Recommendation/Reply form for their records. There is also a completed recommendation reply form supplied to serve as a tracing device in completing the recommendation and to be returned to the safety coordinator when completed.

From the time each department receives its latest recommendations, it will have ninety (90) calendar days to complete them and return the reply form whenever practical.

### **Section Nine – Personal Safety**

In addition to the policies and procedures for the City of Willard's safety program, all employees must follow the additional guidelines concerning personal safety. Safety shall be a condition for continued employment with the City of Willard.

#### **A. Use of seat belts**

To comply with Missouri State Law and help decrease the possibility or severity of injury in vehicle accidents or sudden stops, it is required that a properly adjusted and fastened seat belt be in use while operating any city equipment which has a seat belt. This also applies to employees who operate their own personal vehicle or who are passengers in a personal vehicle while on city business or during working hours.

B. Use of protective gear

All safety and protective gear **MUST** be used according to the Personal Protective Equipment policy listed below:

1. Hard hats will be worn where there is a possibility of falling objects, a possibility of bumping the head, or while working in construction or maintenance work zones.
2. Welders helmets or head shields will be worn when welding or when performing actual welding inspection on construction projects
3. Safety glasses will be worn when grinding or operating a machine tool
4. Safety vests will be worn when flagging traffic, working on the roadway shoulder, and when working in construction and maintenance zones
5. Safety goggles or OSHA approved wrap-around safety glasses will be worn when employees are exposed to: flying particles, drilling, grinding, scraping, or reaming, wire brushing concrete or steel, using a cutting torch, sledging stone, sandblasting or chainsaw, chipper, or weed eater.
6. Chemical safety goggles will be worn when employees are exposed to spray painting, pesticides, or hazardous chemicals.
7. Safety glasses will be worn when there is the potential for eye injury, such as mowing, hammering, working under vehicles, operating power tools, trimming and clearing brush, etc.  
Safety glasses are not intended to be worn when safety goggles or face shields are required.
8. Chainsaw chaps **WILL** be provided for each chainsaw used by the departments. Chainsaw chaps, which may be shared, will be worn by employees when operating a chainsaw.
9. Hearing protection will be worn by employees when operating or working around equipment or tools with high noise levels, i.e. chainsaws, sandblasters, chippers, etc.
10. Thermal gloves will be worn when using welders. Neoprene gloves will be worn when handling chemicals, pesticides, solvents, paint and working with electricity.
11. Safety belts and/or life lines will be used when trimming trees, painting, or engaged in work more than ten (10) feet above the ground.
12. While weedeating or using the blower, employees must wear safety glasses, hearing protection and protective covering on their legs.

Employees **MUST** follow all other safety rules or procedures as prescribed by their individual department.

**FAILURE** to follow the personal Protective Equipment Policy **WILL** result in disciplinary action. See Section 17.

## **Section Ten – Fall Protection**

This fall protection plan addresses the use of conventional fall protection, as well as identifies specific activities that require non-conventional means of fall protection. All employees exposed to potential falls from heights will be trained to minimize the exposures. Fall protection equipment will be provided and its use required by all employees. Supervisors will be responsible for implementation of a fall protection plan for their jobsite.

The management is responsible for ensuring all employees understand and adhere to the procedures of the Fall Protection Plan. Any changes to the Fall Protection Plan must be approved by the Willard Board of Aldermen.

The supervisor is responsible for implementing this Fall Protection Plan. Continual observational safety checks of work operations and the enforcement of the safety policy and procedures shall be regularly enforced. The supervisor is responsible for correcting any unsafe practices or conditions immediately.

Each employee is responsible for learning and adhering to their procedures. It is also the responsibility of the employee to bring to management's attention any unsafe or hazardous conditions or practices that may cause injury to either themselves or any other employees.

### **A. Hazard Identification**

The supervisor will be responsible for identifying fall hazards. The supervisor will evaluate each situation or work procedure where employees may be exposed to a fall of six feet or more. The supervisor will be responsible for developing a plan to eliminate the exposures, if possible, or to select the appropriate fall protection systems and/or equipment.

### **B. Hazard Control**

Engineering controls:

- Personal fall protection
- Guard rail systems
- Positioning devices
- Warning line systems
- Floor opening covers

### **C. Administrative Controls**

- Controlled access zones
- Employee training
- Audits
- Inspections
- Supervision
- Signs

## Fall Protection Required

The following are examples of situations where fall protection is necessary. This listing is by no means complete, and there are many other situations where a fall of 6 feet or more is possible. It should be noted that ladders and scaffolding are not included in this list because they are covered by other OSHA standards and other requirements of our safety program.

### Wall Openings

Employees working on, at, or above or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is six feet (1.8 meters) or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches (1.0 meter) above the walking/working surface must be protected from falling by the use of a guardrail system, a safety net system, or a personal fall arrest system.

### Floor Openings/Holes

Personal fall arrest systems, covers or guardrail systems shall be erected around holes (including skylights) that are more than six feet (1.8 meters) above lower levels.

### Leading Edges

Employees who are constructing a leading edge 6 feet (1.8 meters) or more above lower levels shall be protected by guardrail systems, safety net systems, or personal fall arrest systems.

### Excavations

Employees at the edge of an excavation six feet (1.8 meters) or more deep shall be protected from falling by guardrail systems, fences, barricades or covers. Where walkways are provided to permit employees to cross over excavations, Guardrails are required if it is six feet (1.8 meters) or more above the excavation.

### Formwork and Reinforcing Steel

For employees, while moving vertically and/or horizontally on the vertical face of rebar assemblies built in place, fall protection is not required. OSHA considers the multiple hand holds and foot holds on rebar assemblies provide similar protection as a fixed ladder. Consequently, no fall protection is necessary while moving point to point for heights below 24 feet (7.3 meters). An employee must be provided with fall protection when climbing or otherwise moving at a height more than 24 feet (7.3 meters), the same as for fixed ladders.

### Hoist Areas

Employees in a hoist area shall be protected from falling six feet (1.8 meters) or more by a guardrail systems or personal fall arrest systems. If guardrail systems (or chain gate or guardrail) or portions thereof must be removed to facilitate hoisting operations, such as during the landing of materials, and an employee must lean through the access opening or out over the edge of the access opening

to receive or guide equipment and materials, that employee must be protected by a personal fall arrest system.

#### Ramps, Runways, and Other Walkways

Employees using ramps, runways, and other walkways shall be protected from falling six feet (1.8 meters) or more by guardrail systems.

#### Controlled Access Zones

A controlled access zone is a work area designated and clearly marked in which certain types of work may take place without the use of conventional fall protection systems, guardrail, personal arrest or safety net.

Controlled access zones are used to keep out employees other than those authorized to enter work areas from which guardrails have been removed.

Controlled access zones, when created to limit entrance to areas where leading edge work and other operations are taking place, must be defined by a control line of by any other means that restrict access. Control lines shall consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions, and each must be:

- Flagged or otherwise clearly marked at not more than six-foot (1.8 meters) intervals with high-visibility material
- Rigged and supported in such a way that the lowest point (including sag) is not less than 39 inches (1 meter) from the walking/working surface and the highest point is not more than 45 inches (1.3 meters).
- Strong enough to sustain stress of not less than 200 lbs. Control lines shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge. Control lines also must be connected on each side to a guardrail system or wall. When control lines are used, they shall be erected not less than six feet (1.8 meters) and not more than 25 feet (7.6 meters) from the unprotected or leading edge, except when precast concrete members are erected. In the latter case, the control line is to be erected not less than six feet (1.8 meters) and not more than 60 feet (18 meters) or half the length of the member being erected, which is less, from the leading edge.

Controlled access zones, when used to determine access to areas where overhand bricklaying and related work are taking place, are to be defined by a control line erected not less than ten feet (three meters) and not more than fifteen feet (4.6 meters) from the working edge. Additional control lines must be erected at each end to enclose the controlled access zone. Only employees engaged in overhand bricklaying or related work are permitted in the controlled access zones.



On floors and roofs where guardrail systems are not in place prior to the beginning of leading edge work to take place, only that portion of the guardrail necessary to accomplish that day's work shall be removed.

### Fall Protection Systems

When there is a potential fall of six feet or more, we will utilize one of more of the following means of providing protection:

### Guardrail Systems

Guardrail systems must meet the following criteria:

- Toprails and midrails of guardrail systems must be at least one-quarter inch (.6 centimeters) diameter or thickness to prevent cuts and lacerations
- If wire rope is used for toprails, it must be flagged at not more than six feet intervals (1.8 meters) with high-visibility material
- Steel and plastic banding cannot be used as toprails or midrails
- Manila, plastic or synthetic rope used for toprails or midrails must be inspected as frequently as necessary to ensure strength and stability
- The top edge height of toprails, or (equivalent) guardrails must be 42 inches (1.1 meters) plus or minus three inches (eight centimeters), above the walking/working level
- When employees are using stilts, the top edge height of the top rail, or equivalent member, must be increased an amount equal to the height of the stilts
- Screens, midrails, mesh, intermediate vertical members or equivalent intermediate structural members must be installed between the top edge of the guardrail system and the walking/working surface when there are no walls or parapet walls at least 21 inches (53 centimeters) high.
- When midrails are used, they must be installed to a height midway between the top edge of the guardrail system and the walking/working level
- When screens and mesh are used, they must extend from the top rail to the walking/working level and along the entire opening between top rail supports. Intermediate members, such as balusters, when used between posts, shall not be more than 19 inches (48 centimeters).
- Other structural members, such as additional midrails and architectural panels, shall be installed so that there are no openings in the guardrail system more than 19 inches (48 centimeters).
- The guardrail system must be capable of withstanding a force of at least 200 pounds (890 newtons) applied within two inches of the top edge in any outward or downward directions. When the 200 pound (890 newtons) test is applied in a downward direction, the top edge of the guardrail must not deflect to a height less than 39 inches (one meter) above the walking/working level.

- Midrails, screens, mesh intermediate vertical members, solid panels, and equivalent structural members shall be capable of withstanding a force of at least 150 pounds (667 newtons) applied in any downward or outward direction at any point along the midrail or other member.
- Guardrail systems shall be surfaced to protect employees from punctures or lacerations and to prevent clothing from snagging.
- The ends of top rails and midrails must not overhand terminal posts, except where such overhand does not constitute a projection hazard.
- When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section must be placed across the access opening between guardrail sections when hoisting operations are not taking place.
- At holes, guardrail systems must be set up on all unprotected sides or edges. When holes are used for the passage of materials, the hole shall have not more than two sides with removable guardrail sections. When the hole is not in use, it must be covered or provided with guardrails along all unprotected sides or edges.
- If guardrail systems are used around holes that are used as access points (such as ladderways), gates must be used or the point of access must be offset to prevent accidental walking into the hole.
- If guardrails are used at unprotected sides or edges of ramps and runways, they must be erected on each unprotected side or edge.

#### Personal Fall Arrest Systems

These consist of an anchorage, connectors, and a body belt or body harness and may include a deceleration device, lifeline or suitable combinations. If a personal fall arrest system is used for fall protection, it must do the following:

- Limit maximum arresting force on an employee to 900 pounds (four kilonewtons) when used with a body belt
- Limit maximum arresting force on an employee to 1800 pounds (eight kilonewtons) when used with a body harness
- Be rigged so that an employee can neither free fall more than six feet (1.8 meters) nor contact any lower level
- Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet (1.07 meters)
- Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of six feet (1.8 meters) or the free fall distance permitted by the system, whichever is less.

The use of body belts for fall arrest is prohibited and a full body harness is required.

Personal fall arrest systems must be inspected prior to each use for wear damage and other deterioration. Document the inspection using the Safety Harness Inspection Report. Defective components must be removed from service.

### Positioning Device Systems

Body harness systems are to be set up so that an employee can free fall no farther than two feet (0.6 meters). They shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds (13.3 kilonewtons), whichever is greater.

### Safety Monitoring Systems

When no other fall protection has been implemented, a safety monitoring system shall be implemented. A competent person will monitor the safety of employees and the supervisor shall ensure that the safety monitor:

- Is competent in the recognition of fall hazards
- Is capable of warning employees of fall hazard dangers and in detecting unsafe work practices
- Is operating on the same walking/working surfaces as the employees and can see them
- Is close enough to work operations to communicate orally with employees and has no other duties to distract from the monitoring function.

Mechanical equipment shall not be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in roofing operations on low-sloped roofs.

No employee, other than one engaged in roofing work (on low-sloped roofs) or one covered by a fall protection plan, shall be allowed in an area where an employee is being protected by a safety monitoring system.

All employees in a controlled access zone shall be instructed to promptly comply with fall hazard warnings issued by safety monitors.

### Safety Net Systems

Safety nets must be installed as close as possible under the walking/working surface on which employees are working and never more than 30 feet (9.1 meters) below such levels. Defective nets shall not be used. Safety nets shall be inspected at least one a week for wear, damage and other deterioration. Safety nets shall be installed with sufficient clearance underneath to prevent contact with the surface or structure below.

Items that have fallen into safety nets including, but not restricted to, materials, scrap, equipment and tools must be removed as soon as possible and at least before the next work shift.

### Warning Line Systems

Warning line systems consist of ropes, wires, or chains, and supporting stanchions and are set up as follows:

- Flagged at not more than six-foot (1.8 meters) intervals with high-visibility material

- Rigged and supported so the lowest point including sag is no less than 34 inches (0.9 meters) from the walking/working surface and its highest point is no more than 39 inches (one meter) from the walking/working surface
- Stanchions, after being rigged with warning lines, shall be capable of resisting, without tipping over, a force of at least 16 pounds, (71 newtons) applied horizontally against the stanchion, 30 inches (0.98 meters) above the walking/working surface, perpendicular to the warning line and in the direction of the floor, roof or platform edge.
- The rope, wire or chain shall have a minimum tensile strength of 500 pounds (2.22 kilonewtons) and after being attached to the stanchions, must support without breaking the load applied to the stanchions as prescribed above shall be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over.

Warning lines shall be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line shall be erected not less than six feet (1.8 meters) from the roof edge parallel to the direction of mechanical equipment operation, and not less than 10 feet (three meters) from the roof edge perpendicular to the direction of mechanical equipment operation. When mechanical equipment is not being used, the warning line must be erected not less than six feet (1.8 meters) from the roof edge.

#### Covers

Covers located in roadways and vehicular aisles must be able to support at least twice the maximum axle load of the largest vehicle to which the cover might be subjected. All other covers must be able to support at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time. To prevent accidental displacement resulting from wind, equipment or employee activities, all covers must be secured. All covers shall be color-coded or bear the markings "HOLE" or "COVER".

#### Protection from Falling Objects

When guardrail systems are used to prevent materials from falling from one level to another, any openings must be small enough to prevent passage of potential falling objects. No material or equipment except masonry and mortar shall be stored within four feet (1.2 meters) of working edges. Excess mortar, broken or scattered masonry units, and all other materials and debris shall be kept clear of the working area by removal at regular intervals.

During roofing work, materials and equipment shall not be stored within six feet (1.8 meters) of a roof edge unless guardrails are erected at the edge, and materials piled, grouped, or stacked near a roof edge must be stable and self-supporting.

## Training

Employees will be trained in the following areas:

- Fall hazards in the work area
- Procedures for erecting, maintaining, disassembling and inspecting fall protection systems
- The used and operation of controlled access zones and guardrail, personal fall arrest, safety net, warning line and safety monitoring systems
- The employee's roll in the safety monitoring system
- Limitations of mechanical equipment used during the performance of roofing work on low-sloped roofs
- Procedures for equipment and materials handling and storage and the erection of overhead protection
- Employees role in fall protection plans.

## **Section Eleven – Mounting and Dismounting Equipment and Vehicles**

Getting in and out of larger equipment is the source of occupational accidents. The high seating areas require the employee to climb up into the cab. Employees often fall injuring their backs, legs or ankles. Employees should receive training on and supervisors are to enforce the following safety rules:

- Park in an area of low traffic to avoid dismounting into traffic
- Set equipment parking brake
- Maintain a three-point contact when mounting and dismounting by keeping two feet and one hand or two hands and one foot on the machine/ladder/basket at all times
- Face the equipment when mounting or dismounting
- Do not jump down to the ground
- Do not swing out and off of the equipment
- Go slow to prevent slipping
- Make sure shoes are clean of mud or other slippery substances
- Perform regular preventive maintenance inspections on equipment mechanical features, ladders, rungs, handles, handholds and attachment points for personal fall arrest systems
- Seatbelts should always be used, along with any other required equipment

## **Section Twelve – Confined Space Program**

The purpose of this program is to ensure proper protection is taken for all employees working in confined spaces.

### Responsibility

It is the desire of the City of Willard to protect our employees. The City will:

- Evaluate the workplace to determine if any spaces are permit-required confined spaces.

- Inform potentially exposed employees of the permit-required confined spaces.
- Determine if employees will not be allowed to enter permit spaces, and outline measures to prevent employees from entering permit spaces.
- If it is determined employees will enter permit-required spaces, a written permit space entry program must be developed and implemented.

The department supervisor is responsible for this program and has the authority to make decisions to ensure its success.

#### Program Review and Update

The Confined Space Program will be reviewed and updated under these circumstances:

- When the city identifies changing conditions, which cause the current plan to lose its maximum protection
- A review of the permit-required confined space program indicates revisions to the program are necessary
- When the safety officer or supervisor observes a need for review due to employees not following safety requirements

#### General Requirements

We will use alternate procedures for entering a permit space under the conditions below:

- Employees entering a permit space need not comply with the following parts of this program:
  - Permit Required Confined Space
  - Permit System
  - Entry Permit
  - Duties of Authorized Entrants
  - Duties of Attendants
  - Duties of Supervisors
  - Rescue and Emergency Services – providing that
    1. It has been demonstrated and documented the only hazard is actual or potentially hazardous atmosphere
    2. It has been determined that the forced air ventilation alone is sufficient to maintain safe entry
    3. The monitoring and inspection data required by this program is being used.
    4. Initial entry is not needed to collect data.
    5. The determinations and data required above are documented and available to employees who enter the space

Entry under the terms above must be performed in accordance with the following requirements:

Any condition making it unsafe to remove an entrance cover will be eliminated before the cover is removed.

- Before covers are removed, the entrance will be guarded by a barrier that will prevent an employee from accidentally falling through the opening. The barrier will protect employees in the space from foreign objects entering the space. This exposure would be commonly found with a manhole.
- Before an employee enters the space, the internal atmosphere will be tested with a calibrated direct-reading instrument, for the following conditions in the order given:
  - Oxygen content must be 19.5 to 23.5 percent
  - Flammable gases and vapors-lower flammable limits of gases and vapors must be under 10 percent
  - Potential toxic air contaminants.

**\*\*Record continuous monitoring results every two hours**

Continuous Monitoring** Tests to be Taken	Permissible Entry
Percent of Oxygen	19.5 to 23.5 percent
Lower flammable limit	Under 10 percent
Carbon Monoxide	+35 parts per million
Aromatic Hydrocarbon	+1 parts per million *5 parts per million
Hydrogen Cyanide (skin)	*4 parts per million
Hydrogen Sulfide	+10 parts per million *15 parts per million
Sulfur Dioxide	+2 parts per million *5 parts per million
Ammonia	*35 parts per million

\*Short term exposure limit: Employee can work in the area up to 15 minutes  
 +8 Hour time Weighted Average: Employee can work in area eight hours or longer with appropriate respiratory protection.

- There may be no hazardous atmosphere within the space whenever any employee is inside
- Continuous forced air ventilation will be used as follows:
  - An employee may not enter the space until forced air ventilation has eliminated an hazardous atmosphere
  - Forced air ventilation will be directed to ventilate the immediate areas where an employee is or will be, and will continue until all employees have left the space
  - The air supply for the ventilation will be clean and may not increase the hazard

The atmosphere within the space will be continuously tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere.

If a hazardous atmosphere is detected during entry:

1. Each employee will leave the space immediately
2. The space will be evaluated to determine how the hazardous atmosphere developed

3. Measures will be implemented to protect employees from the hazardous atmosphere before a subsequent entry.
4. Before each entry, the employer will document the space is safe for entry and the measures above have been taken with a written certification giving the date, location of the space and the signature of the person providing the certification.

#### Non-Permit Space

A space classified as a permit-required space may be reclassified as a non-permit space:

- If the permit space poses no actual or potential atmospheric hazards and if all hazards are eliminated with entering the space.
- If it is necessary to enter the permit space to eliminate hazards, such entry will be performed under the following parts of this program:
  - If testing and inspection demonstrate that the hazards have been eliminated
  - If the safety officer or supervisor has documented the basis for determining all hazards have been eliminated through a certification that contains the date, location of the space, and the signature of the person making the certification.
  - If hazards arise within a permit space that has been declassified to a non-permit space, each employee will exit the space. The safety officer or supervisor will reevaluate the space and determine if it must be reclassified as a permit space.

#### Outside Subcontractors

In addition to complying with the above-mentioned requirements, each contractor who performs permit space entry will:

- Obtain any available information regarding permit space hazards and entry operations from the City of Willard
- Coordinate entry operations with the City of Willard, when both the City of Willard employees and contractor personnel work in or near permit spaces, as required in this program.
- Inform the City of Willard of the permit space program the contractor will follow and any hazards confronted or created in permit spaces

#### Permit-Required Confined Space

The following measures are necessary to prevent unauthorized entry to a confined space:

1. The safety officer/supervisor will identify and evaluate the hazards of the permit spaces before employees enter them by performing atmospheric testing.
2. We will provide the following equipment at no cost to our employees, and maintain the equipment properly. Supervisors will ensure employees use the equipment properly:
  - a) Test and monitor equipment needed to evaluate the permit space conditions
  - b) Ventilating equipment needed to obtain acceptable entry conditions
  - c) Two-way communication equipment capable of obtaining emergency services



- d) Personal protective equipment appropriate for the location provided by the supervisor.
  - e) Lighting equipment needed to enable safe work in and exit from the space
  - f) Barriers and shields to protect entrants from external hazards
  - g) Equipment needed for safe ingress and egress
  - h) Rescue and emergency equipment to comply with this program
  - i) Any other equipment necessary for safe entry and rescue
3. There will be at least one attendant outside the permit space for the duration of entry operations.
  4. If multiple spaces are to be monitored by a single attendant, means and procedures to enable the attendant to respond to an emergency in one or more spaces without the distraction from the attendant's responsibility under this program will be provided.
  5. The safety officer/supervisor will designate the persons who are to have active roles in entry operations, their duties and provide each with the training required by this program.
  6. The safety officer/supervisor will develop and implement a procedure for summoning rescue and emergency services, for rescuing entrants, and for preventing unauthorized personnel from attempting rescue.
  7. The safety officer/supervisor will develop and implement procedures to coordinate entry operations when employees of more than one employer are entering a permit space so they do not endanger each other.
  8. The safety officer/supervisor will develop and implement a system for the preparation, issuance, use and cancellation of entry permits.
  9. The safety officer/supervisor will develop and implement procedures to coordinate entry after operations are completed.

#### Permit System

1. Before entry is authorized, the supervisor will document the completion of the measures below by preparing an entry permit. The supervisor will develop and implement the means, procedures, and practices necessary for the entry, including:
  - a. Specifying acceptable entry conditions, including recording of gas detector readings
  - b. Isolating the permit space
  - c. Purging, flushing, or ventilating the permit space to eliminate or control atmospheric hazards
  - d. Providing barriers as necessary to protect entrants from external hazards, and
  - e. Verifying conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.
2. Before entry, the supervisor will sign the permit to authorize entry.
3. The completed permit will be made available to all authorized entrants to confirm pre-entry preparations have been completed.

4. The duration of the permit will not exceed the time required to complete the assigned task or job.
5. The supervisor will terminate entry and cancel the permit when:
  - a. Operations have been completed, or
  - b. A condition not allowed under the entry permit arises in or near the permit space.

#### Entry Permit

The entry permit that authorizes entry into a permit space shall identify:

1. The space to be entered,
2. The purpose of the entry,
3. The date and authorized duration of the entry,
4. The authorized entrants,
5. The personnel serving as attendants,
6. The individual serving as the entry supervisor,
7. The hazards of the permit space to be entered
8. The measures used to isolate the space and eliminate or control hazards before entry;
9. The acceptable entry conditions,
10. The results of initial and periodic tests performed below, accompanied by the name or initials of the testers and when the tests were performed;
  - a. Test conditions in the permit space to determine if acceptable entry conditions exist before entry is authorized to begin,
    - Except if isolation of the space is infeasible because the space is larger or is part of a continuous system (such as sewer), pre-entry testing will be performed to the extent feasible before entry is authorized and,
    - If entry is authorized, entry conditions will be continuously monitored in the areas where authorized entrants are working,
  - b. Test of monitor the permit space as necessary to determine if acceptable entry conditions are being maintained during the course of entry operations, and;
11. When testing for atmospheric hazards, test first for oxygen, then for combustible gases and vapors, then for toxic gases and vapors.
12. The rescue and emergency services that can be called and how to call them,
13. The communication procedures used by entrants and attendants to maintain contact with each other,
14. Equipment, such as testing equipment, to be provided for compliance with 29 CFR 1920-146.
15. Any other information necessary to ensure employee safety and
16. Any additional permits, such as Hot Work Permits, issued for work in the space.

## Training

Supervisors will provide training so employees acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned. Training will be provided:

- Before the employee is assigned duties under this regulation.
- Before there is a change in permit space operation that presents a hazard about which an employee has not previously been trained.
- Whenever the supervisor has reason to believe there are inadequacies in the employees' knowledge of these procedures.

The supervisor will certify the required training has been accomplished and the employee is proficient in the duties.

## Duties of the Authorized Entrants

The supervisor shall ensure all authorized entrants:

- Know the hazards they may encounter during entry.
- Make proper use of the required equipment.
- Communicate with the attendant as necessary so the attendant can monitor the entrants and alert them of the need to evacuate as required.
- Alert the attendant when:
  - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or
  - The entrant detects a prohibited condition.

Exit from the permit space as quickly as possible when:

- An order to evacuate is given by the attendant or supervisor.
- The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.
- The entrant detects a prohibited condition.
- An evacuation alarm is activated.

## Duties of Attendants

The supervisor shall ensure that each attendant:

- Knows hazards that may be encountered during entry.
- Is aware of possible behavioral effects of hazard exposure.
- Continuously maintains an accurate count of entrants.
- Remains outside the permit space during entry until relieved by another attendant.
- Communicated with entrants as necessary to monitor their status and to alert them of the need to evacuate.
- Monitors activities inside and outside the space to determine if it is safe and orders evacuation immediately if the attendant:
  - detects any prohibited condition,
  - detects the behavioral effects of hazard exposure in an entrant,
  - detects a situation outside the space that could endanger entrants, or
  - cannot effectively and safely perform all duties required.

- Summon rescue and other emergency services as soon as it is determined that entrants may need assistance to escape.
- Takes action when unauthorized persons approach or enter a permit space while entry is underway.
- Performs non-entry rescues as specified by the employer's rescue procedure.
- Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

#### Duties of Entry Supervisors

The supervisor will ensure that each entry supervisor:

- Knows and understands the hazards that may be encountered during entry.
- Verifies the appropriate entries have been made on the permit.
- Ensures all test specified by the permit have been conducted.
- Ensures all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
- Terminates the entry and cancels the permit as required by this program.
- Verifies rescue services are available and the means for summoning them are operable.
- Removes unauthorized individuals who enter or attempt to enter the permit space during operations.
- Determines entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

#### Rescue and Emergency Services

The following requirements apply when employees enter permit spaces to perform rescue services:

- The safety officer will ensure the rescue personnel is provided with, and is trained to use, personnel protective equipment necessary for making rescues.
- Each member of the rescue service will be trained to perform assigned rescue duties. They will also receive the training required of authorized entrants under this plan.
- Each member of the rescue service will practice making rescues at least once every 12 months.
- Each member of the rescue service will be trained in basic first-aid and CPR.
- If rescue services are performed by emergency services or subcontractors we will:
  - Inform the rescue service of the hazards they may confront when called on to perform a rescue, and
  - Provide the rescue service with access to all permit spaces from which rescue may be necessary to allow them to develop rescue plans and practice rescues.
- To facilitate non-entry rescue, retrieval systems or methods will be used whenever an authorized entrant enters a permit space, unless this would increase risk or would not assist the rescue. Retrieval systems will meet the following requirements:

- Each authorized entrant will use a chest or full body harness with a retrieval line. Wristlets may be used in lieu of a harness if the employer can demonstrate they are a safer, more effective alternative.
- The other end of the retrieval line will be attached to a mechanical device of fixed point outside the permit space so rescue can begin as soon as it becomes necessary.
- If an injured entrant is exposed to a substance for which a Material Safety Data Sheet (MSDWS) or other similar written information is required, that sheet or written information will be made available to the medical facility treating the exposed entrant.

### **Section Thirteen – Lockout/Tagout Program**

This program is to ensure all individuals are protected from unexpected activation or release of stored energy of machinery or equipment. This could occur during maintenance, repairing and cleaning activities. Normal equipment operations are not considered in this program. Lockout is a first means of protection. Warning tags only supplement the use of locks. Tags alone may be used only when the application of a lock is not practical.

#### **Definitions**

**Lockout** – The practice of using keyed or combination security locks to prevent the unwanted activation of mechanical or electrical equipment.

**Tagout** – The practice of using tags in conjunction with locks to increase the visibility and awareness that equipment is not to be energized or activated until such devices are removed. Tagout devices will be non-reusable, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds.

**Activation/Energizing** – To set machinery into motion by starting, switching, pushing, moving or otherwise engaging power sources for such equipment. To provide a flow of electricity or complete a circuit that is the main power source for the machinery/equipment.

**Energy Control Procedures** – Use of lockout/tagout equipment to ensure safe work practices.

**Hazardous Motion** – Motion of equipment under mechanical stress or gravity that may abruptly release and cause injury. Hazardous motion may result even after power sources are disconnected. Examples are coiled springs, raised hydraulic equipment and any sources of potential energy that may cause injury.

## Responsibilities

### City Administrator

Ensure procedures are developed and maintained outlining the lockout/tagout steps for all required equipment. The file will include the location, description, power source, primary hazards of equipment/machinery, a list of the primary operators maintenance personnel and a list of lockout/tagout equipment that is used and maintained on site. They will also ensure supervisors are providing employees with lockout/tagout training.

### Supervisor

Ensure each employee engaging in work requiring lock/tagout of energy sources understands and adheres to adopted procedures. Assure employees have received training in energy control procedures prior to operating the machinery or equipment. Provide and maintain necessary equipment and resources, including accident prevention signs, tags, padlocks, seals, and/or other similarly effective means. Notify the safety department of new or revised equipment, machinery or operations that require the use of lockout/tagout devices during servicing, maintenance or repair. Maintain all training records for lockout/tagout employee training.

### Employees

Adhere to specific procedures as outlined in this document for all tasks that require the use of lock/tagout procedures. Maintain lockout/tagout supplies in maintenance vehicles. Report any hazards that would not be controlled with lock/tagout procedures.

## Lockout/Tagout Equipment

Hardware includes locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners and other devices used for isolating, securing or blocking machines from energy sources.

- The devices shall be singularly identified, the only device used for controlling energy and not used for other purposes
- The devices must be capable of withstanding the environment for the maximum period of exposure time
- The tagout device shall be constructed and printed so exposure to weather conditions will not cause the tag to deteriorate and become illegible
- The tag shall not deteriorate in a corrosive environment
- The devices shall be standardized by one of the following criteria: color, shape or size
- The device shall be substantial enough to prevent removal with the use of excessive force or bolt cutters
- The tagout device and attachment shall be substantial enough to prevent inadvertent removal

## Identification on lockout/tagout device

- Shall identify the applying employee.
- Shall warn against hazardous conditions if the machines are energized.

### Lockout/Tagout Procedures

An equipment survey will be conducted to locate and identify all isolating devices. The survey will identify switches, valves, or other energy isolating devices to be locked or tagged out. More than one energy source (electrical, mechanical, stored energy or others) may be involved. Operators will be trained in the equipment lockout procedures. This training will include the type and magnitude of energy the machine or equipment utilizes.

### Lockout Steps

1. If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc).
2. Operate the switch, valve or other energy isolating device(s) so the equipment is isolated from the energy source(s).
3. The energy source will be identified in the equipment survey. Stored energy (such as that in springs, elevated machine members, rotating flywheels, hydraulic systems and air, gas, steam or water pressure, etc.) must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, etc.
4. Lockout/Tagout the energy isolating devices with assigned individual lock(s) or tag(s).
5. With no employees exposed, test the lockout procedure by testing the operating device. CAUTION: Return operating controls to neutral or off position after the test.
6. The equipment is not locked out.
7. Mark the tag with name and date.

### Machine Power Restoration

1. After servicing and/or maintenance is complete and equipment is ready for normal production operations, check the area around the machines or equipment to ensure no one is exposed.
2. After all tools have been removed from the machine or equipment, guards have been reinstalled and employees are in the clear, remove all lockout or tagout devices.
3. Operate the energy isolating devices to restore energy to the machine or equipment.

### Restoration with more than one operator:

If more than one individual is required to lockout or tagout equipment, each shall place his/her own personal lockout/tagout device on the energy isolating device(s).

1. When an energy-isolating device cannot accept multiple locks or tags, a multiple lockout or tagout device (hasp) may be used.
2. If lockout is used, a single lock may be used to lockout the machine or equipment with the key placed in a lockout box or cabinet, which allows the use of multiple locks to secure it.
3. Each employee will then use his or her own lock to secure the box or cabinet.
4. As each person no longer needs to maintain his or her lockout protection, that person will remove his or her lock from the box or cabinet.

#### Temporary Removal of Lockout Device

If the lockout/tagout device must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, the following sequence of actions will be followed:

1. Clear the machine of all tools and materials
2. Ensure all employees have been safely positioned or removed from the area.
3. Instruct employees to remove the lockout/tagout devices.,
4. Energize and proceed with testing or positioning.
5. De-energize all systems and reapply lockout devices as previously stated.

#### Maintenance When Energy Source Cannot Be Locked

Maintenance, repairing, cleaning, servicing, adjusting or setting up operations that cannot be accomplished with the energy source disconnected may be performed under the following conditions:

- The operating station (i.e.-external control panel) is under the control of a qualified operator.
- Employees are in clear view or communication with each other.
- All employees must be out of the area of hazard.
- Machine elements are locked out separately if the operator is required to leave the control station to install a tool.
- The machine shall be de-energized during adjustment or replacement of mechanical components.

#### Employee Training

Employees will receive annual lockout/tagout training. Employees will be trained on all new equipment prior to machinery operation. All new employees or employees who transfer job duties will be trained in their equipment's lock/tagout procedures.

### **Section Fourteen – Trenching and Excavation Program**

This program sets forth the practices required for trenches or excavations that will be entered by employees with a depth of four feet or greater along any portion of its length. All excavations or trenches four feet deep or greater shall be appropriately benched, shored, or sloped according to the procedures and requirements set forth in this program. Excavations or trenches 20 feet deep or greater must have a protective system designed by a registered professional engineer.

#### General Requirements

All excavations shall be made in accordance with the rules, regulations, requirements, and guidelines set forth in 29 CFR 1926.650, .651, and .652; the OSHA standard on Excavations, except where otherwise noted below.

#### Site Supervisor

The Construction Site Supervisor has the primary responsibility for the implementation of the Trenching and Excavation program at their jobsite. The supervisor has ultimate



responsibility for the safety of the employees and general public affected by the excavation. This includes evaluation of the work to be performed, determination of the means of protection that will be used and adherence to the provisions of this program as appropriate. The supervisor must ensure daily, or more often as required, that site conditions are safe for employees to work in trenches/excavations.

#### Competent Person

The competent person is a person capable of identifying existing and potential hazards and who has authorization to take prompt corrective measures to eliminate these hazards. The competent person is to be clearly designated and be placed in charge of all trenching and excavations performed at the construction site. Underground utilities must be located and marked before trenching or excavation begins.

#### Employees

Employees have the primary responsibility for working in accordance with the provisions of this program. No employee should enter an excavation meeting the scope of this program until authorized by the competent person. Employees are not allowed in the excavation while heavy equipment is digging.

#### Pre-excavation Digging

The location of sewers, telephone, fuel, electric, water lines, or any other underground installations that may be encountered during excavation work must be determined and marked prior to opening an excavation. The Site Supervisor is responsible to make arrangements as necessary with the appropriate utility agency for the protection, removal, shutdown, or relocation of underground installations. If it is not possible to establish the exact location of these installations, the work may proceed with caution if detection equipment or other safe and acceptable means are used to locate the utility.

#### Utility Call Numbers:

Telephone	
Cable	
Gas	
Electric	
Water	
Sewer	
Missouri One Call	1-800-DIG-RITE

Trenching or excavations must not endanger the underground installations or the employees engaged in the work. Utilities left in place should be protected by barricades, shoring, suspension or other means as necessary to protect employees.

#### Protection of the Public

Trenching or excavations must be isolated from public access by a substantial physical barrier. Barricades, lighting and posting shall be installed as appropriate prior to the start

of excavation operations. All temporary excavations of this type shall be backfilled as soon as possible. If left open overnight, sheeting and marking should be considered.

Guardrails, fences or barricades should be installed around excavations adjacent to walkways, roads, streets, paths or other traffic areas. All protection, guarding and signage should meet the requirements of the municipal, State or Federal agency responsible for the roadway. Warning lights or other illumination shall be used as necessary for the safety of the public at night. Wells, holes, pits and similar excavations must be effectively barricaded or covered and posted. Walkways or bridges used by the general public to cross excavations must be equipped with standard guardrails.

#### Surface Encumbrances

All equipment, materials, supplies, buildings, roadways, trees, utility vaults, boulders, etc. that could present a hazard to employees working in the excavation must be removed or supported as necessary to protect employees.

#### Soil Classification

The competent person in charge of the trenching or excavation shall be responsible for determining the soil type. Soil categorizes and rock deposits into four types, as follows:

1. Stable Rock is natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed. It is usually identified by a rock name such as granite or sandstone. Determining whether a deposit is of this type may be difficult unless it is known whether cracks exist and whether or not the cracks run into or away from the excavation.
2. Type A soils are cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) (144 kPa) or greater. Examples of Type A soils are clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. No soil is Type A if it is fissured, is subject to vibration of any type, has previously been disturbed, is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater or has seeping water.
3. Type B soils are cohesive soils with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa). Examples of other Type B soils are angular gravel, silt, silt loam, previously disturbed soils unless otherwise classified as Type C, soils that meet the unconfined compressive strength or cementation requirements of Type A soils but are fissured or subject to vibration, dry unstable rock and layered systems sloping into the trench at a slope less than 4H:1V (only if the material would be classified as a Type B soil).
4. Type C soils are cohesive soils with an unconfined compressive strength of 0.5 tsf (48 kPa) or less. Other Type C soils include granular soils such as gravel, sand and loamy sand, submerged soil, soil from which water is freely seeping and submerged rock that is not stable. Also included in this classification is material in a sloped, layered system where the layers dip into the excavation or have a slope of four horizontal to one vertical (4H:1V) or greater.

### Layered Geological Strata

Where soils are configured in layers, i.e., where a layered geologic structure exists, the soil must be classified on the basis of the soil classification of the weakest soil layer. Each layer may be classified individually if a more stable layer lies below a less stable layer, i.e., where a Type C soil rests on top of stable rock.

All previously disturbed soil is automatically considered Type B or C soil. Soil may be considered Type C by default and no additional tests required.

### Soil Testing and Evaluation

Many kinds of equipment and methods are used to determine the type of soil prevailing in an area, as described below. **(The City will select the methods to be implemented into the program from the following)**

- A. Pocket Penetrometer – Penetrometers are direct reading, spring-operated instruments used to determine the unconfined compressive strength of saturated cohesive soils. Once pushed into the soil, an indicator sleeve displays the reading. The instrument is calibrated in either tons per square foot (tsf) or kilograms per square centimeter (kPa). Penetrometers have error rates in the rate of +/- 20-40%.
  1. Shearvane (Torvane) – To determine the unconfined compressive strength of the soil with a shearvane, the blades of the vane are pressed into a level section of undisturbed soil and the torsional knob is slowly turned until soil failure occurs. The direct instrument reading must be multiplied by two to provide results in tons per square foot (tsf) or kilograms per square centimeter (kPa).
  2. Thumb Penetration Test – The thumb penetration test involves an attempt to press the thumb firmly into the soil in questions. If the thumb makes an indentation in the soil only with great difficulty, the soil is probably Type A. If the thumb penetrates no further than the length of the thumbnail, it is probably Type B soil, and if the thumb penetrates the full length of the thumb, it is Type C soil. The thumb test is subjective and is therefore the least accurate of the three methods.
  3. Dry Strength Test – Dry soil that crumbles freely or with moderate pressure into individual grains is granular. Dry soil that falls into clumps that subsequently break into smaller clumps (and the smaller clumps can be broken only with difficulty) is probably clay in combination with gravel, sand, or silt. If the soil breaks into clumps that do not break into smaller clumps (and the soil can be broken only with difficulty), the soil is considered unfissured unless there is visual indication of fissuring.
- B. Plasticity of West Threat Test – This test is conducted by molding a moist sample of the soil into a ball and attempting to roll it into a thin thread approximately 1/8 inch (3 mm) in diameter by two inches (50 mm) in length. The soil sample is held by one end. If the sample does not break or tear, the soil is considered cohesive.

- C. Visual Test – A visual test is a qualitative evaluation of conditions around the site. In a visual test, the entire excavation site is observed including the soil adjacent to the site and the soil being excavated. If the soil remains in clumps, it is cohesive; if it appears to be coarse-grained sand or gravel, it is considered granular. The evaluator also checks for any signs of vibration. During a visual test, the evaluator should check for crack-line openings along the failure zone that would indicate tension cracks, look for existing utilities that indicate the soil has previously been disturbed and observe the open side of the excavation for indications of layered geologic structuring. The evaluator should also look for signs of bulging, boiling, or sloughing, as well as for signs of surface water seeping from the sides of the excavation or from the water table. If there is standing water in the cut, the evaluator should check for “quick” conditions listed in this document. In addition, the area adjacent to the excavation should be checked for signs of foundations or other intrusions into the failure zone, and the evaluator should check for surcharging and the spoil distance from the edge of the excavation.

#### Protective Systems

Benching, sloping, shoring, under the base of the footing of a foundation or wall require a support system designed by a registered professional engineer. Sidewalks, pavement, utility vaults or other similar structures shall not be undermined unless a support system or another method of protection is provided to protect employees from their possible collapse. Sloping or benching is other the preferred methods of protection. However, shoring or shielding is used when the location or depth makes sloping to the allowable angle impractical.

Sloping – Maximum allowable slopes for excavations less than 20 feet (6.09 m) based on soil type and angle to the horizontal are as follows:

Benching – There are two basic types of benching: simple and multiple. The type of soil determines the horizontal to vertical ratio of the benched side. As a general rule, the bottom vertical height of the trench must not exceed four feet (1.2 m) for the first bench. Subsequent benches may be up to a maximum of five feet (1.5 m) vertical in Type A soil and four feet (1.2 m) in Type B soil to a total trench depth of 20 feet (6.0 m). All subsequent benches must be below the maximum allowable slope for that soil type. For Type B soil the trench excavation is permitted in cohesive soil only.

Shoring or Shielding Protection – Shoring is the provision of a support system for trench faces used to prevent movement of soil, underground utilities, roadways and foundations. Shoring or shielding is used when the location or depth of the cut makes sloping back to the maximum allowable slope impractical. Shoring systems consist of posts, wales, struts and sheeting. There are two basic types of shoring: timber and hydraulic.

#### Shoring Types

Shoring is the provision of a support system for trench faces used to prevent movement of soil, underground utilities, roadways and foundations. Shoring or shielding is used when the location or depth of the cut makes sloping back to the maximum allowable slope impractical. Shoring systems consist of posts, wales, struts, and sheeting. There are two basic types of shoring, timber and aluminum hydraulic.

#### Timber Shoring

The soil type must first be determined. There are six tables of information, two for each soil type. Using the appropriate soil type table, the selection of the size and spacing of the members is then made. The selection of the timber members is based on the depth and width of the trench where the members are to be installed and, in most instances, the selection is also based on the horizontal spacing of the crossbraces. Instances where a choice of horizontal spacing of crossbracing is available, the horizontal spacing of the crossbraces must be chosen by the user before the size of any member can be determined. When the soil type, the width and depth of the trench, and the horizontal spacing of the crossbraces are known, the size and vertical spacing of the crossbraces, the size and vertical spacing of the wales, and the size and horizontal spacing of the uprights can be read from the appropriate table.

### Hydraulic Shoring

Hydraulic shoring is a prefabricated strut and/or wale system manufactured of aluminum or steel. Hydraulic shoring provides a critical safety advantage over timber shoring because employees do not have to enter the trench to install or remove hydraulic shoring.

Other advantages of most hydraulic systems are that they:

- are light enough to be installed by one employee;
- are gauge-regulated to ensure even distribution of pressure along the trench line;
- can have their trench faces “preloaded” to use the soil’s natural cohesion to prevent movement;
- can be adapted easily to various trench depths and widths.

All shoring should be installed from the top down and removed from the bottom up. Hydraulic shoring should be checked at least once per shift for leaking hoses and/or cylinders, broken connections, cracked nipples, bent bases and any other damaged or defective parts.

### Pneumatic Shoring

Pneumatic shoring works in a manner similar to hydraulic shoring. The primary difference is that pneumatic shoring uses air pressure in place of hydraulic pressure. A disadvantage to the use of pneumatic shoring is that an air compressor must be on site.

1. Screw Jacks – differ from hydraulic and pneumatic systems in that the struts of a screw jack system must be adjusted manually. This creates a hazard because the worker is required to be in the trench in order to adjust the strut. In addition, uniform “preloading” cannot be achieved with screw jacks, and their weight creates handling difficulties.
2. Single-Cylinder Hydraulic Shores – generally used in a water system, as an assist to timber shoring systems, and in shallow trenches where face stability is required.
3. Underpinning – involves stabilizing adjacent structures, foundations, and other intrusions that may have an impact on the excavation. As the term indicates, underpinning is a procedure in which the foundation is physically reinforced. Underpinning should be conducted only under the direction and with the approval of a registered professional engineer.



## Shielding Types

### Trench Boxes

Trench boxes are different from shoring because, instead of shoring up or otherwise supporting the trench face, they are intended primarily to protect workers from cave-ins and similar incidents. The excavated area between the outside of the trench box and the face of the trench should be as small as possible. The space between the trench boxes and the excavation side are backfilled to prevent lateral movement of the box. Shields may not be subjected to loads exceeding those the system was designed to withstand.

### Combined Use

Trench boxes are generally used in open areas, but they also may be used in combination with sloping and benching. The box should extend at least 18 inches (0.45 m) above the surrounding area if there is sloping toward excavation. This can be accomplished by providing a benched area adjacent to the box.

Earth excavation to a depth of two feet (0.61 m) below the shield is permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench and there are no indications while the trench is open of possible loss of soil from behind or below the bottom of the support system. Conditions of this type require observation on the effects of bulging, heaving and boiling as well as surcharging, vibration, adjacent structures, etc., on excavating below the bottom of a shield. Careful visual inspection of the conditions mentioned above is the primary and most prudent approach to hazard identification and control.

### Spoil Protection

Temporary Spoil – must be placed no closer than two feet (0.61 m) from the surface edge of the excavation, measured from the nearest base of the spoil to the cut. This distance should not be measured from the crown of the spoil deposit. Spoil should be placed so that it channels rainwater and other runoff water away from the excavation. Spoil should be placed so that it cannot accidentally run, slide, or fall back into the excavation.

Permanent Spoil – should be placed at some distance from the excavation. Permanent spoil is often created where underpasses are built or utilities are buried. The improper placement of permanent spoil, i.e. insufficient distance from the working excavation, can cause an excavation to be out of compliance with the horizontal-to-vertical ratio requirement for a particular excavation. This can usually be determined through visual observation. Permanent spoil can change undisturbed soil to disturbed soil and dramatically alter slope requirements.

### Safety Practices

Surface Crossing of Trenches – Surface crossing of trenches should be discouraged. However, if trenches must be crossed, such crossings are permitted only under the following conditions:

- Vehicle crossings must be designed by and installed under the supervision of a registered professional engineer.
- Walkways or bridges must be provided for foot traffic. These structures shall:
  - have a safety factor of four;
  - have a minimum clear width of 20 inches (0.51 m);
  - be fitted with standard rails;
  - extend a minimum of 24 inches (.61 m) past the surface edge of the trench.

Access and Egress – Access to and exit from the trench require the following:

- Trenches four feet or more in depth should be provided with a fixed means of egress, ramps, or ladders.
- Ramps should be solely used by employees for access and exit designed by competent person; secured against displacement; sound, free from trip hazards and slip-resistant.

- Spacing between ladders or ramps must be such that an employee will not have to travel more than 25 feet laterally to the nearest means of egress.
- Ladders will be tied, block or otherwise secured in place. Ladders will extend a minimum of 36 inches (0.9 m) above the landing.
- Metal ladders should be used with caution, particularly when electric utilities are present.

Exposure to Vehicles – The following procedures should be followed to protect employees on the jobsite from being injured or killed by vehicle traffic:

- Employees are required to wear warning vests or other suitable garments marked with or made of reflective or highly visible materials.
- Designate a trained flag person along with the use of appropriate signs, signals and barricades in accordance with the Uniform Manual of Traffic Control Devices.

Exposure to Falling Loads – Employees must be protected from loads or objects falling from lifting or digging equipment. Procedures designed to ensure their protection include:

- Employees are not permitted to work under raised loads.
- Employees are required to stand away from equipment that is being loaded or unloaded.
- Equipment operators or truck drivers may stay in their equipment during loading and unloading if the equipment is properly equipped with a cab shield or adequate canopy.

Warning Systems for Mobile Equipment – The following steps should be taken to prevent vehicles from accidentally falling into the trench:

- Barricades must be installed where necessary.
- Where an operator's view of the edge of an excavation is obstructed, a warning system, such as hand or mechanical signals must be used.
- Stop logs must be installed if there is a danger of vehicles falling into the trench.
- Soil should be graded away from the excavation; this will assist in vehicle control and channeling of run-off water.

Hazardous Atmospheres and Confined Spaces – Employees shall not be permitted to work in hazardous and/or toxic atmospheres. Such atmospheres include those with:

- Less than 19.5 percent or more than 23.5 percent oxygen;
- A combustible gas concentration greater than 20 percent of the lower flammable limit; and
- Concentrations of hazardous substances that exceed those specified in the specified in the *Threshold Limit Values for Airborne Contaminants* established by the ACGIH (American Conference of Governmental Industrial Hygienists).

All operations involving such atmospheres must be conducted in accordance with OSHA requirements for occupational health and environmental controls (see Subpart D of 29 CFR 1926) for personal protective equipment and for lifesaving equipment (see Subpart E, 29 CFR 1926). Engineering controls (e.g. ventilation) and respiratory protection may be required.

Some trenches qualify as confined spaces. When this occurs, compliance with the Confined Space Program and company procedures is required.

Hazardous conditions might exist in a trench when excavating near a leaking utility pipe or underground storage tank. Geological conditions also can create hazardous conditions. Consider the following prior to entry to test for atmospheric contaminants where hazardous conditions could reasonably be expected:

- Testing should be conducted before employees enter the trench and should be done regularly to ensure that the trench remains safe
- The frequency of testing should be increased if equipment is operating in the trench.
- Testing frequency should also be increased if welding, cutting or burning is done in the trench.

Employees required to wear respiratory protection must be trained, fit-tested and enrolled in the company's Respiratory Protection Program.

Emergency Rescue Equipment – Emergency rescue equipment is required when a hazardous atmosphere exists or can reasonably be expected to exist. Requirements are as follows:

- Respirators must be of the type suitable for the exposure. Employees must be trained in their use and a respirator program must be instituted.
- Attended (at all times) lifelines must be provided when employees enter bell-bottom pier holes, deep confined spaces, or other similar hazards.
- Employees who enter confined spaces must be trained.

Emergency Response – Emergency response for all excavations should be preplanned. A phone call should be made prior to the excavation to determine who would perform a trench collapse rescue. Also determine what equipment, if any, is needed at the site for the rescue team. Larger local fire departments will usually bring their own equipment. A rural department might not be as well equipped or trained.

Standing Water – Methods for controlling standing water and water accumulation must be provided and should consist of the following if employees are permitted to work in the excavation:

- Use of special support or shield systems approved by a registered professional engineer.
- Water removal equipment, i.e. well pointing, used and monitored by a competent person.
- Safety harnesses and lifelines used in conformance with 209 CFP 1926.104.

- Surface water diverted away from the trench.
- Employees removed from the trench during rainstorms.
- Trenches carefully inspected by a competent person after each rain and before employees are permitted to re-enter the trench.

#### Inspections

The competent person is required to conduct inspections:

- Daily and before the start of each shift by using the City of Willard “Daily Trenching Inspection Log”.
- As dictated by the work being performed in the trench.
- After every rainstorm.
- After other events that could increase hazards, such as snowstorm, windstorm, thaw, earthquake, dramatic change in weather, etc.
- When fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom or other similar conditions occur.
- When there is a change in the size, location, or placement of the spoil pile.
- When there is any indication of change or movement in adjacent structures.

### **Section Fifteen – New Driver Orientation Program**

The City of Willard in its effort to promote driver safety has developed the following program to ensure that every new hire employee whose job requires operating a municipal vehicle/equipment, possess the knowledge and skill necessary to do so safely.

The qualifications of the new driver is based on the following:

- A. Pre-employment motor vehicle record check
- B. Previous experience in operating different types of vehicles and equipment
- C. Driver evaluation performed
- D. New driver orientation performed (checklist used) ( Exhibit E)
  - a. Supervised road test performed
  - b. Supervised operating test

### **Section Sixteen – Driver Qualifications**

Drivers of all vehicles and equipment owned by the City of Willard, shall meet the following criteria:

- A. Possess a valid state driver’s license of the proper class
- B. Motor vehicle record check performed annually
- C. Annual road test (check ride)

### **Section Seventeen – Fleet Safety**

Inspection of vehicles and equipment shall be conducted weekly on a formal basis. The inspections shall be conducted by those employees assigned the task by their supervisors.

- A. Vehicle Safety Inspection form (Exhibit G) shall be maintained on all vehicle and equipment. Any problems found during inspection shall be noted and repaired as soon as possible. Records shall indicate when repairs were made and by whom. These records shall be backlogged for a period of as long as that vehicle is in service.

Employees involved in automobile accidents while driving a city vehicle must:

- A. Not move the vehicle;
- B. Notify the police giving location and whether an ambulance is needed;
- C. Take the names and addresses of other person(s) involved in the accident;
- D. Take the names and addresses of all witnesses present;
- E. Not make any statements concerning the accident other than to the investigating law enforcement officer;
- F. Advise supervisor as soon as possible;
- G. Fill out proper forms required by city and state;
- H. Give one copy of report to City Administrator, City Clerk, CFO, Department Head and Supervisor;
- I. Not leave the scene of the accident.

## **Section Eighteen – Employee Health and Safety Programs**

In order to encourage employees in healthy living, the City of Willard offers these programs:

- A. CPR and First Aid training – This training is given annually to employees interested in acquiring these skills
- B. Return to Work – Employees that are not able to perform their regular duties will not be allowed to return to work until they have a recommendation by a doctor and agreement by the City of Willard

## **Section Nineteen – Training**

Employee training is very important. When workers understand the reasons for the program requirements and the need to protect them, they will be better motivated to participate actively in the program and to cooperate.

Before doing work requiring use of personal protective equipment (Exhibit J), employees must be trained to know when personal protective equipment is necessary: what type is necessary; how it is to be worn; and what its limitations are, as well as know its proper care, maintenance, useful life and disposal. In many cases, more than one type of personal protective equipment will provide adequate protection.

Department heads are required to certify, in writing, that training has been carried out and that employees understand it. Each written certification shall contain the name of each employee trained, the date(s) of training, and identify the subject of the certification.

## **Section Twenty – Work Zone Barricading Program**

- A. Work Zone Procedures: Minimum standards for traffic control are set forth in the following paragraphs and can be seen in diagram form on the following pages.
- B. Advance Warning Area:
  - 1. Daytime – Warning Device – orange shape with warning
  - 2. Nighttime – Warning Device – Barricades with flashing lights
- C. Spacing:
  - 1. Warning Device #1: One-half the length of taper
  - 2. Warning Device #2: Start of the taper
  - 3. Barricade Only #3: End of taper – night only
  - 4. Transition Area: Taper length from Table 1
  - 5. Buffer Space: Cones spaced approximately ten (10) feet apart
  - 6. Work Area: Cones spaced approximately five (5) feet apart
  - 7. Termination Area: Downstream taper is one-fourth the length of the transition area taper
  - 8. Adjustments: It is understood and accepted that every operation does not offer the ideal location for work zone barricading. In some cases, private driveways, street intersection, alleys and other immovable objects may restrict the use of certain distances set by these minimum standards. In these cases, the supervisor should exercise good judgment based on the principles set forth in this program to protect the safety of the public and the employee.

## **Section Twenty One – Disciplinary Action**

Failure to follow procedures established in the City of Willard Safety Handbook or established safety policies will result in the following disciplinary action:

- A. First Violation – Oral reprimand
- B. Second Violation – Written reprimand
- C. Third Violation – Suspension
- D. Fourth Violation in a twelve (12) month period - Termination

## **EMPLOYEE FLEET SAFETY ACKNOWLEDGEMENT**

### **Driver:**

- Possess a valid state driver's license for any vehicle you are operating on company business.
- Know and obey all driving laws wherever you drive.
- You shall not possess, consume or be under the influence of alcohol or illegal drugs while operating a City vehicle. Doing so will result in disciplinary action up to dismissal.
- Notify management whenever taking prescription drugs that could affect your driving and should not operate the vehicle.
- Drivers shall not use cell phones, two-way radios, computer devices, or text messaging while driving.
  - Only use these devices and similar items when the vehicle is legally parked.
  - These devices distract you and cause accidents.
- Turn on your headlights whenever driving, this helps others see you and avoids accidents.
- Notify your supervisor of any driving tickets you get immediately.
- Drive with courtesy and respect for other drivers. You must not cause confrontations while driving a City vehicle, your safety and our City image is at risk.

### **Driver & Passengers:**

- Shall wear seat belts at all times when driving on behalf of the City or while in company vehicles.
  - Seat belts are provided and shall be maintained in working order.
  - All passengers must be properly belted in with their seatbelt.
  - Only employees, authorized passengers or those on business are authorized in vehicles.
  - Never pickup a hitchhiker.

### **Parking:**

- Park only in designated areas. You will be reimbursed for all parking fees on City business, but NOT parking tickets. Notify your supervisor immediately of any tickets you receive with the City vehicle, but you must pay these promptly yourself.
- Avoid backing as much as possible, drive through a space with front of vehicle pointed to the open.

### **Inspections:**

- You must do a complete "walk around" before getting into the vehicle. This is a simple visual inspection for any obvious problems before you start the vehicle, such as vehicle damage; low, flat, or bad tires; leaking fluids, etc.
- You shall report unsafe vehicle conditions. It is your responsibility to immediately report problems to your supervisor or manager.



- If the vehicle is not safe to drive, it must be tagged out of service until the repair is made.
- Be sure that the vehicle is equipped with the required safety items and legal documents.
  - Flares or reflectors; proof of insurance; registration
  - Accident report forms and disposable accident camera

Accidents:

- Any accident with the City vehicle or with a personal vehicle being operated for City business must be reported immediately to your supervisor and a police report filed.

I, \_\_\_\_\_, have read and understand the Employee Fleet Safety Acknowledgement. I understand that my failure to adhere to any of these guidelines may result in disciplinary action up to and including termination.

_____	Date	_____
Employee Signature		Supervisor Signature

## **Acknowledgement**

I have received the City of Willard Employee Safety Manual and understand its contents. I understand that the handbook is intended to provide an overview of the City's safety policies and does not necessarily represent all such policies in force.

By signing, I understand these terms and that I am bound to the above statements.

Employee Signature \_\_\_\_\_

Date

Employee Name Printed \_\_\_\_\_