

**ADMINISTRATIVE
PROCEDURE**

SUBJECT: **EXCAVATION & TRENCHING
POLICY**

1.0 POLICY

The City of Winona recognizes Excavations and Trenching as a potentially hazardous job duty. Therefore, only trained and authorized City of Winona employees will be allowed to create or work in or around excavations and/or trenches.

2.0 ORGANIZATIONS AFFECTED

All Departments/Divisions with employees trained and authorized by the City of Winona.

These authorized and trained employees will be given information on hazards associated with trenches including contact with numerous underground utilities, hazardous atmospheres, water accumulations, and collapse of adjacent structures.

This policy applies to all City of Winona work and any contractors working on City of Winona projects or on City of Winona property.

3.0 ADMINISTRATIVE DUTIES

The City of Winona is responsible for developing and maintaining the written Excavation Procedures.

Our Excavation Procedures are administered under the direction of our competent person(s), someone capable of identifying existing and predictable hazards in the surrounding or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

4.0 PROCEDURES

4.1 Before Excavating

Before beginning excavating, an excavation checklist must be completed for any and all sites. (See Appendix A)

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4.2 Protective Support Systems

The City of Winona protects each employee in an excavation from cave-ins during the excavation by an adequate protective system designed in accordance with OSHA standards. Protective system options include proper sloping or benching of the sides of the excavation; supporting the sides of the excavation with timber shoring, (approved alternatives of timber shoring) or aluminum hydraulic shoring; or placing a shield between the side of the excavation and the work area. The City of Winona has the following standard operating procedures regarding protective support systems for excavation, in accordance with safe practices and procedures and OSHA excavation regulations:

- If the excavation is made entirely of stable rock then no protective system is necessary or used.
- If the excavation is less than 4 feet in **depth (provided there is no indication of a potential cave-in)**, then no protective system is necessary or used.
- If the excavation is greater than 4 feet in depth, then proper shoring & trenching must be utilized.

4.3 Sloping

When sloping is used to protect against cave-ins, options can be chosen for designing sloping systems by the superintendent/competent person.

The superintendent/competent person shall choose the best option for sloping for the job at hand and is familiar with Appendix B of 1926 Subpart P – Sloping & Benching.

4.4 Benching

Based on the site, timber shoring (approved alternatives to timber shoring), aluminum hydraulic shoring, shielding or other protective systems may be selected as the best options for the protective support system by the superintendent/competent person who must be familiar with Appendix C-F of 1926 subpart P on shoring.

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4.5 General Requirements for Excavations

The following rules are to be followed at all times by all employees working on, in, or near excavations, as applicable:

- General site inspection
- Means of access and egress
- Wet conditions
- Hazardous Atmosphere
- Protective support systems
- Soil analysis/classification

5.0 TRAINING

The Public Works Director and Department Superintendents will identify all new employees and make arrangements to schedule training. The Safety & Health Coordinator will conduct initial training and evaluation and will arrange for instructor(s) that have the necessary knowledge, training, and experience to train/retrain all City of Winona excavation workers periodically.

5.1 Training Certification

After an employee has completed the training program, the City of Winona will keep records certifying that each excavation worker has successfully completed excavation training. The certificate includes the name of the worker, the date(s) of the training, and the signature of the person who did the training. The Safety & Health Department is responsible for keeping a copy of all training records.

5.2 Current Certified Excavation Workers

Under no circumstances shall an employee create or work in an excavation until he/she has successfully completed the City of Winona's excavation training program. This includes all new excavation workers unless proof of previous training is satisfactorily documented.

6.0 INSPECTION PROCEDURES

Our competent person(s) inspects excavations daily and during poor weather. Our inspection checklist is attached to these written Excavation procedures. Public Works Superintendents are responsible for retaining completed inspection checklists for one year.

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6.1 Personal Protective Equipment

We have determined that several hazards that require personal protective equipment are possible in and around excavations.

For this reason, we require that our excavation workers wear the following PPE (Personal Protective Equipment)

1. Safety Shoes
2. Reflective Vests
3. Hard Hats
4. Safety Glasses (if task appropriate)
5. Hearing Protection (if task appropriate)
6. Other as needed for task.

All excavation workers required to wear this equipment are trained when it is necessary; what equipment is necessary; how to properly put on, take off, adjust, and wear it; limitations of the equipment; and proper care, maintenance, useful life, and disposal of PPE.

6.2 Non-Excavation Worker Protection

As for those who don't work in or around excavations, but who may become bystanders, we require that they **stay at least 20 feet from the work site.**

6.3 Emergency Action Plan

Whenever a trench or excavation site is determined unsafe for any reason, call 911 immediately. Report circumstances of emergency location, number of victims and present status of victims. **Do not attempt to dig out victim or rescue by going into the trench.**

7.0 RECORDKEEPING

We keep a copy of the following documents at the job site during construction of a particular excavation protective system and then store them in the department where they will be readily available to OSHA upon request:

- Tabulated data for designing any of our sloping or benching systems.
- Designs of any sloping or benching systems approved by a registered professional engineer.
- Manufacturer's specifications, recommendations, and limitations for designs of support

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systems, shield systems, and other protective systems drawn from manufacturer's tabulated data.

- Manufacturer's approval to deviate from the specification, recommendations, and limitations for designs of support systems, shield systems, and other protective systems drawn from manufacturer's tabulated data.
- Tabulated data for designing any of our support systems, shield systems, and other protective systems.
- Designs of all support system, shield systems, and other protective systems approved by a registered professional engineer.

8.0 APPENDIX:

Appendix A – City of Winona Excavation Checklist

DEPARTMENT: FIRE	SUPERSEDES: 10/15/01	PREPARED BY: SKP	APPROVED BY: EBS	DATE: 4/22/04
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City of Winona Excavation/ Trenching Operations CHECKLIST

Project location: _____ Date: _____
 Utilities locate request form (Gopher State One Call 1-800-252-1166) was completed
 and locates done: (date of call) _____ (date completed) _____
 Trench Measurements: Depth: _____ Length: _____ Width: _____
 Soil Type: _____ (see attached "Soils Analysis Checklist")
 Type of Protective System Used: _____

FOR ALL EMERGENCIES IMMEDIATELY CALL 911

GENERAL INSPECTION OF THE JOB SITE

Yes	No	N/A	
			Excavations, adjacent areas, and Protective Systems inspected by the competent person daily, prior to the start of work.
			Competent person has the authority to remove workers from the excavation immediately.
			Surface encumbrances supported or removed.
			Employees protected from loose rock or soil that could possibly pose a hazard by falling or rolling into the excavation.
			Hard hats worn by all employees.
			Spoils, materials, and equipment set back a minimum of 2 feet from the edge of the excavation.
			Warning vests, or other highly visible garments, provided and worn by all employees exposed to public vehicular traffic.
			Barriers and walkways with guardrails must be provided at all excavations over four feet deep.
			Warning system established and utilized when mobile equipment is operating near the edge of an excavation.
			Employees are prohibited from working on the faces of sloped or benched excavations above other employees

WET CONDITIONS

YES	NO	N/A	
			Precautions need to be taken to protect employees from accumulation of water.
			A competent person will monitor water removal equipment.
			Inspection of site will be made following any rainstorm.
			All surface water controlled and diverted.

SOIL ANALYSIS

This checklist must be completed when the analysis is performed to determine the soil/s type present at the excavation site where trenching is to occur. The competent person performing the analysis must use and be familiar with Appendix A to 1926 Subpart P – Soil Classification. A separate analysis must be performed for each change in soil conditions, such as layers in the excavation wall.

Project Location: _____
Weather: _____ Date: _____ Time: _____
Measurements of Trench: Depth: _____ Length: _____ Width: _____
Sample taken from: _____

Visual Test

Particle Type: Fine Grained (cohesive) _____
Course Grained (sand or Gravel) _____

Water Conditions: Wet ___ Dry ___ Submerged ___ Surface Water Present

Manual Test

Plasticity: Cohesive _____ Non-Cohesive _____
Dry Strength: Granular (crumbles easily) _____ Cohesive (Broken w/difficulty) _____

Thumb Test Performed _____

Pentameter or Shearvane _____

Wet Shake Test _____

Soil Classification

Type "A" Soil _____

Clay, Silty clay, sandy clay, clay loam, and in some cases silty clay loam and sandy clay loam.

Type "B" Soil _____

Angular gravel, (similar to crushed rock), silt, silt loam, sandy loam and in some cases silty clay loam, and sandy clay loam

Type "C" Soil _____

Granular soil including gravel sand and loamy sand.

Note: Type A soil – no soil is a "Type A" if the soil is fissured, subject to vibration, previously disturbed, layered dipping into the excavation on a slope of 4h:1v.

For selection of the appropriate protective system, use the flow chart in Appendix F of the 1926 Subpart P standard.

- Sloping or Benching (appendix B) Specify Angle _____
- Timber Shoring or alternative approved shoring (appendix C)
- Aluminum Hydraulic shoring (appendix D)

Signature of Competent Person completing check list

Name: _____

Date: _____

MEANS OF ACCESS AND EGRESS

YES	NO	N/A	
			Lateral travel distance to a means of egress does not exceed 25 feet for excavation 4 feet or more in depth.
			Ladders, when used, must extend 3 feet above the edge of the trench and be secured.
			Competent person must design structural ramps used by employees and Registered Professional Engineers (RPE) must design ramps used for equipment.
			Employees must be protected from cave-ins while entering, working in, or exiting excavations.

HAZARDOUS ATMOSPHERE

YES	NO	N/A	
			Atmosphere tested when there is a reasonable possibility of oxygen deficiency, or build up of other hazardous gases, that may expose an employee to a hazard. (<u>Oxygen content is within normal limits between 19.5% & 21%</u>)
			Ventilation is provided to prevent flammable gas build up to 20% of the lower explosive limit of the gas.
			Testing conducted to ensure that atmosphere remains safe from toxic gas/es.
			Does this space meet requirements of a confined space? (if YES initiate confined space entry permit Policy 112 – 7)

PROTECTIVE SUPPORT SYSTEMS

			Materials and/or equipment selected on soil analysis expected loads and trench parameters.
			Materials and equipment inspected and in good condition.
			Materials and equipment not in good condition was removed from service and will not be returned till repaired and approved by a RPE.
			Protective systems installed without exposing employees to hazards of cave-ins, collapses, or from being struck by materials or equipment installed from the top down to the bottom.
			All structures and supports are securely fastened and adjacent structures securely supported.
			The backfill process must progress with the removal of the support system.
			Shield system is placed to prevent lateral movement.
			Employee/s are prohibited from remaining in a Trench Box when being moved vertically.

Signature of Competent person completing check list:

Name: _____ **Date:** _____