JMU
Facilities Management

FACILITIES MANAGEMENT DEPARTMENT

POLICY: IV: 04 - Excavation
Procedure Review: Annually

DATED: September 1997
UPDATED: December 2024

APPROVED: Executive Director of Facilities and Construction: _____

I. PURPOSE

The purpose of this procedure is to establish guidelines for the location and identification of underground utilities and safe digging practices to any groundbreaking operations.

II. DEFINITIONS

A. Competent person - One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees and who has the authority to take prompt corrective measures to eliminate them. This person will be required to receive training through Risk Management (to include confined space, emergency protocol, fall protection, PPE and use of checklists.)

B. Excavation - Digging, boring, post driving, or any other operation that penetrates below the surface of the ground. This includes the removal of trees, bushes, sidewalks, etc. that could damage buried utilities.

C. Protective system - A method of protecting employees from cave-ins, material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

D. Cave-in - The separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

E. Trenching - A specific form of excavation. A trench is a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

III. RESPONSIBILITIES

A. Executive Director of Facilities and Construction - Responsible for overall implementation of this procedure.

B. Directors, Managers and Supervisors - Responsible to ensure all utility systems are properly maintained, Miss Utility is notified and clearance is maintained.

C. Competent Person

Has the authority to take corrective actions for the below:

a. Responsible for obtaining a valid permit prior to digging.

b. Capable of identifying existing or likely hazards in the work area.

c. In case of emergencies, contacts appropriate emergency services.

d. Inspects the work area daily for potential hazards as needed as well as after each rain storm.

e. If digging five (5) feet or more, providing notification to Risk Management through online notification tool available on their website at: https://www.jmu.edu/riskmgmt/work-notification.shtml.

f. If digging five (5) feet or more, completing the Excavation/Trenching Project Information form (see Appendix A) and submit to: riskmanagement@jmu.edu. Also responsible for attaching documentation to the work order in AiM.

g. If digging five (5) feet or more, recording activity in the Daily Excavation Inspection Log (see Appendix B) and submit to: riskmanagement@jmu.edu. Also responsible for attaching documentation to the work order in AiM.

h. Where oxygen deficiency (atmosphere containing less than 19.5% oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than four (4) feet (1.22 m) in depth.

D. Geospatial Engineering Services (GES) Manager - Ensures university utility drawings are maintained accurately, are up-to-date and responsible for utility locating.

E. Utilities Locator - Shall, ensure affected utilities are physically located and marked on-site in order to ensure (to the maximum extent possible) utilities systems are not damaged during the course of the project.

F. Project Manager and/or Landscape Supervisor - Responsible for any project that involves excavation and coordinates the notification of affected university departments as well as initiating the process. If a utility is damaged, the Competent Person is to take immediate action to ensure safety and correction of the damage.

IV. PROCEDURE

A. The Director of Engineering and Construction shall ensure the following paragraph is included in the bid documents for contract work-requiring excavation:

1. Excavation –The Excavation Contractor/Landscape Supervisor shall call VA811 (800-552-7001) at least 48 hours, excluding Saturdays, Sundays, and legal State and National Holidays, prior to the commencement of excavation or demolition or as required by VA811. JMU will comply with and will enforce this and all other requirements identified within the Virginia "Underground Utility Damage Prevention Act". Damages repaired by JMU will be billed to the contractor. In addition, any work

within a City of Harrisonburg right-of way requires a permit from the City Public Works Department. A copy of the permit(s) must accompany personnel performing excavation. Any holes left after excavation (i.e., test boring holes) shall be completely filled and compacted to prevent settlement. Failure to comply with these requirements will result in work shutdown, repair of damages by the contractor, and may result in a fine, contract termination, and/or default.

B. The excavation contractor or landscape supervisor shall mark limits of excavation with white paint, white flags, and/or white ribbon. No color other than white may be used to mark the excavation area.

C. All utilities in close proximity to work shall be identified with the appropriate color paint at the site by the utilities locator. Color-coding is as follows: red – electric, yellow – gas, oil and steam, orange – communications, blue – water, green – sewer and storm drains, purple – irrigation, white – excavation limits.

D. The employee performing work shall not penetrate the surface until they have received notification from VA811 that the ticket has cleared all utilities in the excavation area.

E. Involvement of FM staff during an excavation project is governed by this procedure. The project manager shall ensure all open holes during the excavation are properly protected by barricades. Any open holes after excavation (i.e., test boring holes) shall be properly filled with rock dust and compacted to prevent later settlement.

F. The project manager or utilities locator shall note any utility changes or additions discovered during the excavation process. Such changes are to be provided to the Engineering design drafting technician and incorporated in the GIS data system.

G. Excavations (trenching is a form of excavation) have the following specific requirements:

1. A competent person must be identified for each excavation performed by Facilities Management and follow applicable OSHA standards (refer to 29 CFR 1926 Subpart P).

2. If digging over five (5) feet, the competent person shall complete the Excavation/Trenching Project Information form and the Daily Excavation Inspection Log. Copies of documentation shall be attached to the work order in AiM.

3. Trenches five (5) feet (1.5 meters) deep or greater require a protective system unless the excavation is made entirely in stable rock. If less than five (5) feet deep, a competent person may determine a protective system is not required. Trenches 20 feet (6.1 meters) deep or greater shall not be completed by FM staff and require the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional engineer in accordance with 1926.652(b) and (c).

4. A stairway, ladder, or ramp or other safe means of egress shall be located in trench excavations that are four (4) feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

5. FM employees exposed to vehicular traffic shall wear warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

6. No employee is permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any

spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded to provide adequate protection for the operator during loading and unloading operations.

7. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

8. In addition to the requirements of 29 CFR 1926.50-1910.146 subparts D and E (appendix B & C), to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

   a. Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of 29 CFR 1926.50 - 1910.146.

   b. Adequate precautions shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

   c. When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

9. Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended while in use. Equipment can be obtained at the campus power plant.

10. Employees shall not work in excavation areas where there is accumulated water, or in excavations in which water is accumulating unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

11. If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

12. If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person.

13. Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protections of associated.

14. Excavation below the level of the base or footing of any foundation, or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when: a support system such as underpinning is provided to ensure the safety of employees and the stability of the structure; or

the excavation is in stable rock; or a registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or a registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

15. Sidewalks, pavements, and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

16. Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide adequate protection.

17. Employees shall be protected from excavated or other material or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such material or equipment at least two (2) feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

18. Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

19. Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

20. Walkways shall be provided where employees or equipment are required to cross over excavations.

21. Adequate barrier, physical protection, shall be provided at excavations. Wells, pits, shafts, trenches, etc. shall be barricaded or covered. Upon completion of exploration and other similar operations, temporary wells, pits, shafts, trenches, etc., shall be backfilled.

V. TRAINING

A. FM employees who are or may be involved in excavations or trenching are to receive training. As a minimum, training is to include all aspects of this procedure. For training, contact the Risk Management Safety Training Coordinator.

B. Training records are to be retained by the Risk Management Safety Training Coordinator and should include: the name of employee, signature of the employee, date of training, and the name of the instructor and signature of the trainer.

Appendix A – Excavation/Trenching Project Information Form (Use when digging over five feet)

JMU Facilities Management Excavation/ Trenching Project Information (Daily)			
Location/Reason/Work Order #:			Date/Time:
Miss Utility Work Order Number:			Date/Time:
Miss Utility Area Marked:			Date/Time:
JMU Risk Management Work Notification:			Date and Time:
Project Manager:	**Contact Info:**		
Project Competent Person: (must stay on site)	**Contact Info:** ☐ **Has authority to take quick action to eliminate hazards or stop work**		
Site Inspection Complete Prior to start of work	☐		
Excavation Depth:	**Required Actions:**		
☐Less than 4 feet or personnel will not be entering	Contact Miss Utility only. Remainder of this assessment form does not need to be completed provided there are no additional hazards, such as potential cave-in, high traffic areas.		
☐Between 4 and 20 feet	Continue to complete this form. When project complete, connect to AiM and copy to riskmangement@jmu.edu		
☐>20 feet	Contact Project Manager for further instructions		
Hazard	**Specify Control Measure (N/A if not applicable)**		
Warning System Established	☐ Employees understand what signals will be used to evacuate		
Assume all soil on campus is Class C			
Cave-In:	☐ Trench Box (Soil is assumed Class C) ☐ Slope/Bench Soil 1 ½ Height to 1 Vertical		
Surface Encumbrances	☐ N/A	☐ Removed ☐ Supported	
Underground Installations	☐ N/A	☐ Protected/ Supported ☐ Owner action required	
Access/Egress required at 4 feet	☐ N/A	☐ Ladder extended at least 3' above edge of trench ☐ Ramp ☐ Stairs (within 25 feet)	
Vehicular Traffic	☐ N/A	☐ Barricades ☐ Ramp ☐ Flag Person	
Falling Loads	☐ N/A	☐ Personnel clear of equipment being loaded	
Mobile Equipment	☐ N/A	☐ Barricade/stop log ☐ Signs/Flags ☐ Signal Person	
Hazardous Atmosphere	☐ N/A	☐ Forced Air Ventilation ☐ Respiratory Protection ☐ Continuous Air Monitor Required	
Water Accumulation	☐ N/A	☐ Pump ☐ Safety Harness with life line ☐ Diversion ☐ Drainage ☐ Removal monitored by Comp. Person	
Adjacent Structures	☐ N/A	☐ Shored ☐ Braced ☐ Underpinned ☐ RPE review	
Loose Rock or Soil	☐ N/A	☐ Spoil piles and equipment at least 2 feet from edge ☐ Scaling ☐ Protective Barrier ☐ Benching ☐ Restraint Device	
Fall Protection	☐ N/A	☐ Barricades 6' from edge ☐ Guardrails/ Walkways	
Security (Overnight)	☐ N/A	☐ Fencing/Barricades ☐ Holes covered ☐ Warning Signs ☐ Lighting	
Personal Protective Equipment	☐ N/A	☐ Work Boots ☐ Hard Hat ☐ Safety Glasses ☐ Vest	
All PPE and Equipment Inspected Daily		☐ YES	
In Case of Emergency:			
Other:	JMU 540-568-6911	Work Control: 540-568-6101	Harrisonburg Emergency 911

Appendix B – Daily Excavation Inspection Log (Use when digging over five feet)

JMU DAILY EXCAVATION INSPECTION LOG		
Location/Reason:		Start Date/Time:
		End Date/Time:
Competent Person:		
Date/Time Weather	**Inspection Results**	**Corrective Action(s) taken (describe):**
	☐ All conditions acceptable ☐ Hazardous condition detected (specify)	☐ No corrective action(s) required at this time ☐ Corrective action required (specify)
	☐ All conditions acceptable ☐ Hazardous condition detected (specify)	☐ No corrective action(s) required at this time ☐ Corrective action required (specify)
	☐ All conditions acceptable ☐ Hazardous condition detected (specify)	☐ No corrective action(s) required at this time ☐ Corrective action required (specify)
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