



Virginia Department of Fire Programs
Technical Rescue Division
TRENCH RESCUER – LEVEL II
Chapter 8 (8.2) NFPA 1006, 2013 edition
TRENCH RESCUE TECHNICIAN
Chapter 11 (11.4) NFPA 1670, 2009 edition

Section 1 - ADMINISTRATIVE GUIDELINES

1.1 Course Description:

This program meets or exceeds the requirements for NFPA 1006 *Standard for Technical Rescuer Professional Qualifications*, Chapter 8, Level II. The student will learn to perform at the Technician Level as specified in NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*, Chapter 11.

This 32 hour program includes classroom and practical training to prepare the student to function at the Trench Rescue Level II (Technician). Topics include: Intersecting trenches, deep trenches, installing supplemental sheeting and shoring systems, constructing load stabilization systems, lifting loads, coordinating the use of heavy equipment as well as releasing and extricating victim from entrapment

Students will receive a VDFP Certificate of Attendance for completing this class. In order to be ProBoard certified to the NFPA 1006 – 2008, students must successfully complete a written and practical skills testing session.

1.2 Course Information

This course meets or exceeds:

NFPA 1006 Standard on Technical Rescuer Professional Qualifications, 2013 edition Chapter 8.2, Trench Rescuer – Level II

NFPA 1670 Standard on Operations and Training for Technical Search and Rescue Incidents 2009 edition; Trench and Excavation Search and Rescue Technician, Chapter 11.

OSHA 29 CFR 1926.650-652, (Subpart P) Excavations

Standard Correlations

1006 Standard

- 8.2.1 Support an intersecting trench
- 8.2.2 Install supplemental sheeting and shoring
- 8.2.3 Construct load stabilization systems
- 8.2.4 Lift a load
- 8.2.5 Coordinate the use of heavy equipment
- 8.2.6 Release a victim from entrapment

Course Correlation

- Session 8, 9, and 13
- Session 7 and 12
- Session 5, 6, and 13
- Session 5, 6, and 13
- Session 4, 6, and 13
- Session 9, 12, and 13



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1670 Standard

- 11.4.3 (1) Evaluate existing and potential trench conditions
- 11.4.3(2) Identify construct and remove manufactured protective Systems
- 11.4.3(3) Continuously monitor for LEL, LFL, and Toxicity
- 11.4.3 (4) Identify the construction application limitations and removal of supplemental sheeting and shoring
- 11.4.3(5) Adjust a protective system based on digging operations
- 11.4.3(6) Rigging and placement of isolation systems

Course Correlation

- Session 6, 7, 8, 9,10,11,12,13
- Session 6 ,8, 10, 11, 12, 13
- Session 10, 11, 12, 13
- Session 9, 10, 11, 12, 13
- Session 10, 11, 12, 13
- Session 9, 13

1.3 Logistical Requirements of Host Jurisdiction

- 1) Classroom facilities
 - a. Suitable size, comfortable and meeting the needs to deliver course lecture.
 - b. Adequate and appropriate restroom facilities (to include training grounds).
 - c. Lighting able to be controlled for projector operation.
 - d. Tables and chairs for 24 students.
 - e. LCD Projector and screen, computer with remote mouse.
 - f. Chalkboard, whiteboard, or easel pad with markers or chalks.
- 2) Trenches to be dug (coordinate with lead instructor)
 - a. Two , straight wall trenches
 - i. Each trench four (4) feet wide, eight (8) feet deep and twenty (20) feet long
 - ii. These trenches will be modified during the program
 - 1. “T” trench, from midpoint of existing trench, dig a perpendicular straight wall trench four (4) feet wide, eight (8) feet deep, and eight (8) feet long
 - 2. “L” trench, from the end of existing trench, dig a perpendicular straight wall trench four (4) feet wide, eight (8) feet deep, and sixteen (16) feet long.
 - b. One, deep walled trench, four (4) feet wide twelve (12) to fourteen (14) feet deep and twenty (20) feet long.
 - c. Minimum thirty (30) feet clearance between each trench.
- 3) Spoil piles to be placed a minimum of two (2) feet away from trench lip
- 4) Heavy pipe or objects to trap victim
- 5) Local heavy rescue apparatus assigned to class
- 6) Local collapse equipment assigned to class
- 7) Mud Hog with hoses for dewatering of trench
- 8) Lumber requirements for local jurisdiction:
 - a. 4” x 6” x 12’ timbers, eight (8) each
 - b. 2” x 4” x 12’, ten (10) each
 - c. 2” x 12” x 12’, eight (8) each
 - d. 6” x 6” x 12’, six (6) each
 - e. 4” x 4” x 12’, four (4) each



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- 9) 16 penny duplex nails, ten (20) pounds
- 10) Assorted cribbing for load stabilization
- 11) Heavy duty come-a-long, two each
- 12) Chains with hooks and fasteners to stabilize and lift load
- 13) Heavy duty anchor slings and webbing to stabilize and lift load
- 14) 10-1/4" circular saw or chain saw, one (1) each
- 15) Generator, minimum 5 kw
- 16) Electrical cords, 100 foot, three (3) (each)
- 17) Two (2) ventilation fans, electric powered
- 18) Rope rescue equipment for patient removal
- 19) One (1) - Four function, calibrated atmospheric monitor capable of monitoring Oxygen%, Hydrogen Sulfide PPM, Flammability%, Carbon Monoxide.
- 20) Heavy construction equipment capable of digging trenches fourteen foot deep with operator on site for all days of the class.
- 21) Two (2) rescue manikins to be placed in trenches (i.e. hose dummy, Rescue Randy)
- 22) Two (2) fire service rated ladders, minimum twelve (16) feet long
- 23) Local point of contact with knowledge and authorized access of training sites to be used.
- 24) Hoses, water supply, and clean up supplies and adequate area for equipment cleaning.
- 25) VDFP Trench Rescue and Vehicle Rescue trailers. Trailers must be requested by host jurisdiction for non-funded or reimbursable schools. Funded classes will be provided trailers without an additional request being needed

1.4 Required Student Materials/Equipment/Uniforms

- 1) PPE
 - a. NFPA rated fire helmet or technical rescue helmet
 - b. Steel toed boots
 - c. Gloves – tight fitting gloves which allow manual dexterity. Firefighting gloves are not acceptable.
 - d. Eye protection
 - e. Hearing protection
 - f. Long pants

1.5 Course Pre-requisites

- 1) Students MUST be 18 years of age.
- 2) Successful completion of Virginia Department of Fire Programs *Rope Rescue Level I* program.
- 3) Successful completion of Virginia Department of Fire Programs *Confined Space Rescue Level II* program.
- 4) Successful completion of Virginia Department of Fire Programs *Vehicle Rescue Level II* program.



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- 5) Students must be a member in good standing with a recognized fire, EMS, or emergency services agency/department to apply to attend.
- 6) Students shall be psychologically, physically, and medically capable to perform assigned duties and functions at technical search and rescue incidents and to perform training exercises in accordance with of NFPA 1500 *Standard on Fire Department Occupational Safety and Health Program*, Chapter 10-Medical and Physical Requirements.

Technical rescue is psychologically and physically demanding work. Students must be capable of lifting heavy loads, working at various elevations and operating in potentially hazardous environments.

1.6 Course Registrations

- 1) All students must be pre-registered in VDFP's Fire Service Training Records System (FSTRS) before being allowed to participate in the class.
- 2) Students will be required to sign a Virginia Department of Fire Programs *Notice of Acknowledgement* form verifying the students meets the course pre-requisites.
- 3) No unregistered students (walk-ins) will be allowed.
- 4) Class size is limited to 24 students.

1.7 Course Curriculum/Outline

Trench Rescuer Level II (Technician Level) 24 hour program

- 1) Welcome/Introduction/Paperwork
- 2) Review Trench Operations for Non-Intersecting Trenches
 - A. Trench incident size-up
 - B. Trench incident action plan
 - C. Support operations
 - D. Protective systems for non-intersecting trenches
 - E. Victim Management
 - F. Operation termination procedures
- 3) Atmospheric monitoring



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- 4) Heavy Equipment Orientation
 - A. Communication

- 5) Heavy lifting and moving in trench environment
 - A. Estimating load calculation
 - B. Stabilization techniques
 - i. Outside and inside trench
 - ii. Stabilization systems
 - iii. Cribbing configurations
 - C. Lifting techniques
 - i. Outside and inside trench
 - ii. Levers and air bags

- 6) Practical stations
 - A. Heavy equipment stabilization and lifting
 - i. Protect Non-Intersecting, Straight Wall, Non-Collapsed Trenches
 1. Traditional Sheeting and Shoring – Pneumatic Shores
 - a. Trench incident size-up
 - b. Trench incident action plan
 - c. Support operations
 - d. Installation of protective system
 - ii. Heavy equipment stabilization and lifting
 - ii. Heavy object stabilization and lifting
 - i. Protect Non-Intersecting, Straight Wall, Non-Collapsed Trenches
 1. Traditional Sheeting and Shoring – Pneumatic Shores
 - a. Trench incident size-up
 - b. Trench incident action plan
 - c. Support operations
 - d. Installation of protective system
 - ii. Heavy object stabilization and lifting

 - 7) Intersecting Trenches
 - A. Interpreting and applying tabulated data
 - B. “T” Trench
 - C. “L” Trench



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8) Intersecting Trenches

A. “T” Trench

i. Traditional Sheeting and Shoring – Pneumatic Shores

1. Trench incident size-up
2. Trench incident action plan
3. Support operations
4. Installation of protective system
5. Patient management
6. Termination operations

B. “L” Trench

i. Traditional Sheeting and Shoring – Pneumatic Shores

1. Trench incident size-up
2. Trench incident action plan
3. Support operations
4. Installation of protective system
5. Patient management
6. Termination operations

9) Protective Operations for Deep Trenches

- A. Supplemental sheeting and shoring
- B. Trench shields (trench boxes)
- C. Benching and sloping
- D. Isolation devices

10) Managing a Complex Trench Incident

11) Deep Trench Operations

A. Traditional Sheeting and Shoring – Pneumatic Shores

- i. Trench incident size-up
- ii. Trench incident action plan
- iii. Support operations
- iv. Installation of protective system
- v. Patient management
 1. Disentanglement
 2. Removal
- vi. Supplemental sheeting and shoring
- vii. Digging operations
- viii. Termination operations



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12) Managing Complex Trench Operations

- A. Intersection trenches with patient trapped by heavy equipment/objects
- B. Traditional Sheeting and Shoring – Pneumatic Shores
 - i. Trench incident size-up
 - ii. Trench incident action plan
 - iii. Support operations
 - iv. Installation of protective system
 - v. Patient management
 - 1. Disentanglement
 - 2. Removal
 - vi. Supplemental sheeting and shoring
 - vii. Digging operations
 - viii. Stabilization and lifting
 - ix. Termination operations

13) Skills Testing

8 hours

1.8 Reference Material and Additional Information

Trench Levels I and II, Richardson, Delmar, 2010

Trench Rescue Awareness, Operations, Technician, Second Edition, Martinette, Jones and Bartlett, 2008

1.9 Course Completion Requirements for Students

- 1) Students are required to attend 100% of the classroom and practical sessions.
- 2) Successful completion of all required skills as indicated in the course outline.
- 3) Students are required to successfully complete a “Skills Check-Off” sheet. Each skill is pass/fail, with two opportunities to complete each skill.