



Trench Rescue Technician (2014)

Course Plan

Course Details

Description:	This course will take you from classroom discussion to working safely and efficiently in a trench rescue environment. This hands-on training program will cover topics that include: Trench and Excavation Regulations, Understanding Soil, Trench Configurations, Trench Hazards, Rescue Team Preparation, Incident Response, Initial On Scene and Pre-Entry Operations, Shoring Systems and Components, Installation of Shoring Systems, Victim Rescue and Recovery and Incident Termination.
Designed For:	All fire service and allied emergency response personnel
Authority:	Office of the State Fire Marshal
Prerequisites:	Rescue Systems 1
Standard:	N/A
Hours:	24 hours
Maximum Class Size:	24
Instructor Level:	Senior/Primary instructor
Instructor/Student Ratio:	1 primary instructor per 12 students 1-Squad Site: 12:1 (12 total students) with 1 Senior Instructor 2-Squad Site: 12:1 (24 total students) with 1 Senior Instructor and 1 Primary Instructor
Restrictions:	The Senior Instructor must validate the trench rescue training site for compliance with the Trench Rescue Site Requirements and Equipment Standards.
SFT Designation:	FSTEP

Required Resources

Instructor Resources

To teach this course, instructors need:

Required

- *Trench Rescue Technician Manual* (CMC Rescue, Inc., ISBN: 978 0984587513)

Online Instructor Resources

The following instructor resources are available online at

<https://osfm.fire.ca.gov/divisions/state-fire-training/fstep-curriculum/>

- Instructor PowerPoint
- Student Task Book

Student Resources

To participate in this course, students need:

- *Trench Rescue Technician Manual* (CMC Rescue, Inc., ISBN: 978 0984587513)
- Student Task Book

Facilities, Equipment, and Personnel

A Trench Rescue Technician Training Site must have facilities, structures, work areas, materials, props, tools, and equipment of adequate size, type, and quantity, to safely support, the technical and manipulative training required to deliver the Trench Rescue Technician curriculum. The following facilities, equipment, or personnel are required to deliver this course:

Facilities

- Standard classroom equipped for 24 students
- Whiteboards or easel pads with appropriate writing implements
- Projector/TV with appropriate laptop connections
- Wifi/Internet access
- Rehabilitation area
- Area to demonstrate and practice skills (trench approach and size-up, cutting station, panel construction, tools and equipment skills stations)
- Open field area with approved excavated trenches. See page 5
- One (1) "L" Trench and one (1) "T" Trench excavated according to trench diagram.
 - "L" Trench. Both legs of the trench to be 36" wide; each leg to be 20' long. One leg 8' deep and one leg 10' deep
 - "T" Trench. The top of the "T" is to be 36" wide, 23' long and 8' deep. The upright portion of the "T" is 10' long, 60" wide and 8' deep
 - Trenches must be in suitable soil for training with no extreme hazards

- Trenches will be collapsed with manikins for each scenario

Site Capacity

A Trench Rescue Technician training site, evaluated by the Senior Instructor, will insure that the site has the capacity to deliver the required training safely. A one-squad site is capable of delivering training to twelve (12) students or one (1) squad. A two-squad site may be capable of delivering training to a maximum of twenty-four (24) students simultaneously.

- One-squad Site
 - Supports the instruction for teaching one (1) squad, a maximum of twelve (12) students on the site
 - One (1) Trench Rescue Technician Senior Instructor is required for a student instructor ratio of 12:1
- Two-squad Site
 - Supports the instruction for teaching two (2) squads, a maximum of twenty-four (24) students on the site
 - One (1) Trench Rescue Technician Senior Instructor and one (1) Trench Rescue Technician Primary Instructor are required to maintain a student instructor ratio of 12:1

Senior Trench Rescue Technician Senior Instructor Site Responsibilities

- The Senior Instructor will validate the training site for compliance with the Trench Rescue Technician Site Requirements and Equipment Standards prior to submitting a course request to State Fire Training
- Any deficiencies in the training site, or equipment, shall be corrected before the class start date

Site Requirements

The following are minimum requirements for a Trench Rescue Technician Training Site:

- The facilities and props should be in close proximity to each other to facilitate timeframes.
- The requesting agency assumes all responsibility, liability, and maintenance for the engineering design, strength, stability, and adequacy of all props.
- The requesting agency further assumes all responsibility, liability, and maintenance for all tools, equipment and supplies used at the site for the delivery of Trench Rescue Technician classes. This includes, but is not limited to, ladders, ropes, rescue hardware and software, hand tools and power tools

Equipment Standards

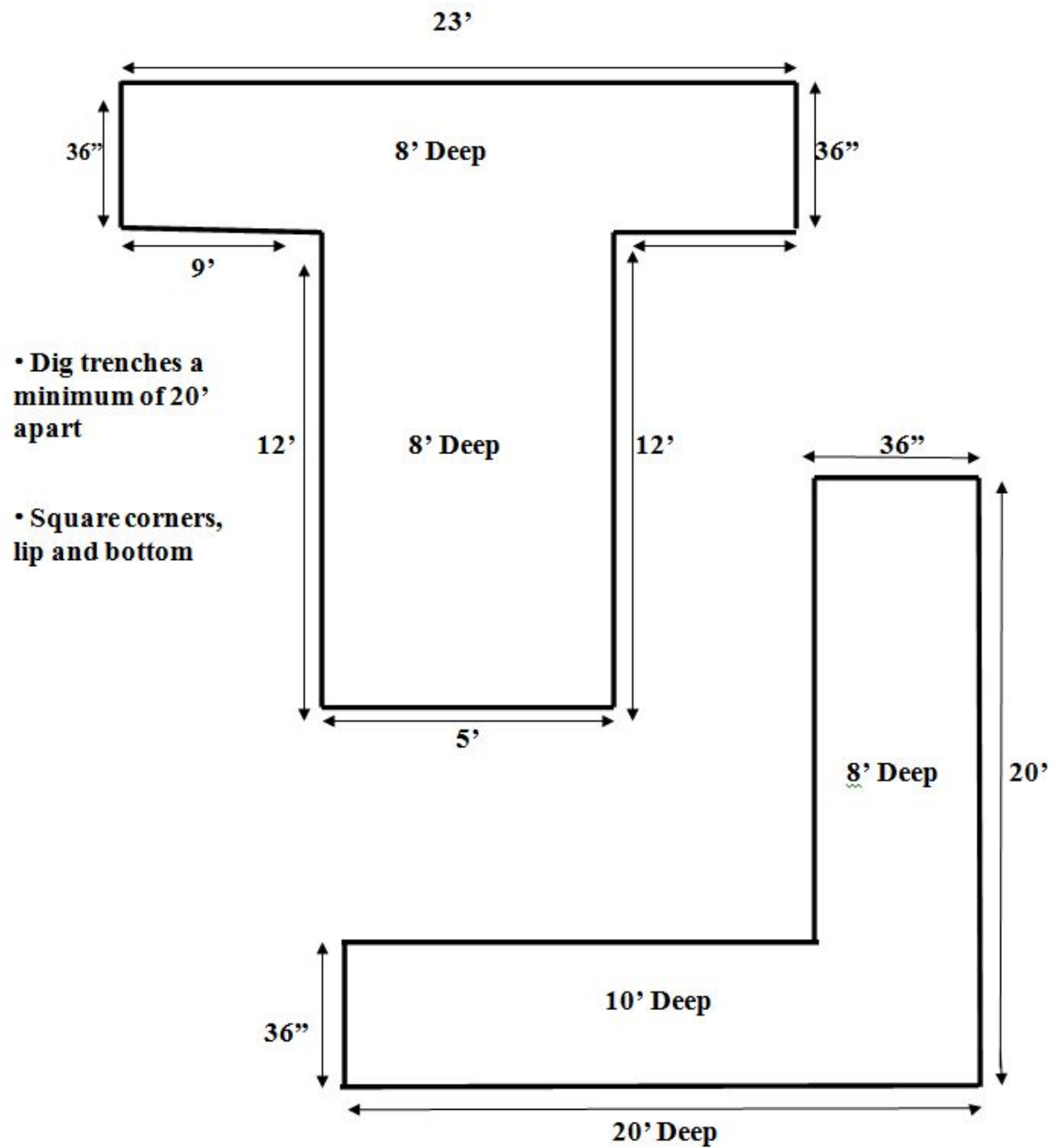
- The equipment listed below is the minimum for each Trench Rescue Technician Training Site to support one (1) squad/twelve (12) students or two (2) squads/twenty-four (24) students

- Student safety is of paramount importance when conducting this type of high-risk training associated with a Trench Rescue Technician course
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Trench Rescue Technician Equipment Inventory	1 Squad (12 students)	2 Squads (24 Students)
Plywood 4'x8'x3/4"	14	24
2"x12"x10' (8' is okay, 10' preferred)	14	24
2"x4"x8'	10	18
4"x4"x8'	14	24
4"x4"x12' (walers)	4	4
4"x4"x14' (walers)	4	6
6"x6"x12' (waler)	1	1
18", 4"x4" wedges	12 pair	24 pair
Finland Form plywood, 4'x8'x3/4"	1	2
Wood Pallet for cutting station	1	1
Nails, 16D Duplex	30 lbs.	50 lbs.
Hydraulic Shores w/ extensions, pump and release handles	1	1
Pneumatic Shores w/regulator, controller and hoses	2	4
Trench Air Cushions w/regulator, controller and hoses	1	1
SCBA Cylinders	4	4
Pipe Screw Jacks, 1½" w/ pipe cutter and pipe wrench	3	6
Pipe; 11/2" schedule 40 steel; 10' lengths	2	4
Ellis Post Screw Jacks; 4"x4"	4	6
Lifeline 1/2"x 50' (in bag)	4	6
Utility Line 25'	6	10
Webbing 1"x20'	4	8
Backboard w/straps	1	1
Rescue Litter (optional)	1	1

101/4" Circular Saw w/extension cord	1	1
Palm Nailer w/regulator, and hoses	1	1
Chain Saw; gasoline, w/fuel can, chain oil and extra chain	1	1
Generator; minimum 2.5 kw w/extension cord	1	1
Crow Bars	2	4
Shovels; round point, long handle	2	2
Shovels; square point, long handle	2	2
Shovels; round point, short D handle or Military type folding	2	2
Grubbing Tools	2	4
Pike Pole; 10'-12'	1	1
5 gal. buckets w/wire or rope handles	4	6
Framing Hammers	6	12
Single Jack (short handled 3-4 lb. sledge hammer)	3	6
Tape Measure's 25'	6	12
Speed Squares	1	2
Carpenter Pencils	6	12
Squad Boxes or Buckets	3	6
Duct Tape	1	2
Salvage Cover	1	1
Ladders; straight or roof, 12'-16'	4	6
Ladder Belts or Escape Belts	4	6
Ventilation Fan	1	1
Atmospheric Monitor w/tubing	1	1
Manikins	3	3
Backhoe and Operator	1	1
Trench Rescue Tactical Worksheets	2	2
Daily Trench Inspection Worksheets	3	3
Trench Rescue Site Safety Officer Worksheets	2	2
Incident Action Plan Documents	1	1

Required Trench Rescue Technician Trench Props



Introduction

Terminal Learning Objective

Students provided with information from this chapter, along with headlines from current events, will be able to recall fatality statistics and case histories and accurately apply this information to potential liabilities in trench rescue operations.

Enabling Learning Objectives

1. Cite fatality and injury statistics from case histories and recent trench rescue incidents.
2. Understand their personal liability and the potential for criminal prosecution, including monetary fines when standard operation guidelines are not adhered to

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 1

Terminal Learning Objective

Students, with the information provided in this chapter, will demonstrate their knowledge by accurately citing specific regulations that impact trench rescue operations.

Enabling Learning Objectives

1. Cite Federal Standard for Trenching and Excavations
2. Cite California Standard for Trenching and Excavations
3. List examples of other related regulations that may impact trenching operations
4. Understand the importance of OSHA regulations as they relate to training and exercises

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 2

Terminal Learning Objective

Students provided with information from this chapter, will be able to accurately describe soil classifications and types, soil testing procedures and other factors affecting trench stability.

Enabling Learning Objectives

1. Discuss basic soil facts and statistics
2. Cite soil classifications and types
3. Demonstrate soil testing
4. Identify trench hazards and other factors affecting soil

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 3

Terminal Learning Objective

Students, with the information provided in this chapter, will be able to accurately recognize types of trenches and excavations, along with the types of collapses, collapse patterns, and factors leading to trench failures.

Enabling Learning Objectives

1. Define and describe a trench
2. Identify the different types of trenches
3. Recognize different types of collapse
4. Distinguish various collapse patterns
5. Identify the points of a trench

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 4

Terminal Learning Objective

Students provided with the information provided in this chapter, will accurately describe the different types of hazards associated in and around the trench incident as well as how to mitigate those hazards.

Enabling Learning Objectives

1. Identify types of trench collapses and failures
2. Identify hazardous trench soil conditions
3. Understand gravity as a hazard
4. Identify water hazards
5. Understand surcharge loads
6. Identify underground utilities as hazards
7. Understand hazardous atmospheres
8. Identify vibration hazards
9. Develop a mitigation plan for identified hazards

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 5

Terminal Learning Objective

Students, with information provided in this chapter, will accurately recall and discuss rescue team preparation including rescue tool maintenance and use, scene accountability, personal protective equipment and scene safety.

Enabling Learning Objectives

1. Discuss the importance of trench rescue training
2. Identify and discuss the use of proper tools and equipment
3. Discuss the importance of rescue team building
4. Discuss the importance of accountability and discipline
5. Discuss mitigation techniques and the importance of safety working in and around trench emergencies
6. Discuss and demonstrate proper personal protective equipment (PPE)

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 6

Terminal Learning Objective

Students provided with information from this chapter, will accurately outline trench rescue considerations when responding to a given trench rescue incident.

Enabling Learning Objectives

1. Discuss the importance of the incident location
2. Recall the importance of the Time of day
3. Discuss the impact of weather on trench rescue operations
4. Identify and develop Enabling Learning Objective strategies that restrict incident access
5. Recognize the importance of responding with adequate trench rescue resources

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 7

Terminal Learning Objective

Students with information provided in this chapter, will be able to accurately identify and integrate the operational priorities at a given trench rescue incident.

Enabling Learning Objectives

1. Understand the importance of initiating the Incident Command System
2. Demonstrate how to approach the trench
3. Recall how to conduct a proper size-up.
4. Understand the importance of the Reporting/Responsible party
5. Identify all of the potential hazards at the trench incident
6. Accurately recognize USA markings
7. Students will understand victim considerations
8. Conduct a pre-entry briefing

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 8

Terminal Learning Objective

Students, provided with information from this chapter along with the provided tools, equipment, and materials, will accurately describe and demonstrate the pre-entry operation essential to safely perform in-and-around a given trench rescue incident.

Enabling Learning Objectives

1. Assign a site Safety Officer
2. Demonstrate the proper placement of ladders
3. Establish edge protection around the trench
4. Demonstrate the proper method of clearing the spoil
5. Identify proper air-monitoring techniques
6. Demonstrate the proper use of ventilation equipment
7. Identify and mark unsafe hazards
8. Conduct a Pre-Entry Briefing

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 9

Terminal Learning Objective

Students, with information provided in this chapter along with the provided tools, equipment, and materials, will accurately identify and demonstrate various types of protective systems in trench rescue operations.

Enabling Learning Objectives

1. Identify sloping and benching systems
2. Identify trench shields and boxes
3. Demonstrate timber shoring systems
4. Demonstrate mechanical shoring systems including hydraulic, pneumatic and screw jacks

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 10

Terminal Learning Objective

Students, provided with information from this chapter along with the provided tools, equipment, and materials, will accurately identify shoring system components and demonstrate how they are deployed and used in a given trench rescue operation.

Enabling Learning Objectives

1. Describe a shoring system and components
2. Demonstrate the placement of shoring systems in a trench
3. Identify how many shoring systems are used in a trench rescue
4. Identify and establish the safe zones in the trench

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 11

Terminal Learning Objective

Students, with information provided in this chapter along with the provided tools, equipment, and materials, will accurately demonstrate the installation of shoring systems in a given trench rescue operation.

Enabling Learning Objectives

1. Demonstrate the use of Trench Data Sheets
2. Set-up and demonstrate the use of a cutting station
3. Demonstrate the installation of sheeting and panels
4. Apply shoring systems concepts and components
5. Demonstrate proper nail patterns and positive connections
6. Demonstrate the use of backfill and back-shoring

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 12

Terminal Learning Objective

Students, provided with information from this chapter along with the provided tools, equipment, and materials, will accurately identify factors that affect victim search, soil removal, and demonstrate victim rescue and recovery at a given trench rescue operation.

Enabling Learning Objectives

1. Discuss techniques used for victim search in a trench
2. Demonstrate soil removal as it relates to victim recovery
3. Demonstrate victim treatment in a trench rescue
4. Demonstrate victim packaging in a trench rescue
5. Demonstrate victim removal in a trench rescue

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Chapter 13

Terminal Learning Objective

Students, with information provided in this chapter along with the provided tools, equipment, and materials, will accurately demonstrate all of the elements necessary to terminate a given trench rescue operation.

Enabling Learning Objectives

1. Provide incident documentation and notifications
2. Demonstrate techniques that increase rescuer safety during removal of shoring and equipment from the trench
3. Identify the techniques to keep the scene safe upon leaving the area
4. Describe the overall goals of critical incident stress debriefing

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor