Trench Rescue

(NFPA 1006: Trench Rescue Awareness/Operations/Technician)

Certification Training Standards Guide (2021)





California Department of Forestry and Fire Protection Office of the State Fire Marshal State Fire Training

Trench Rescue

Certification Training Standards Guide (2021)

Publication Date: November 2022

This CTS guide utilizes the following NFPA standards to provide the qualifications for State Fire Training's Trench Rescue (2021) certification:

• NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)

State Fire Training coordinated the development of this CTS guide. Before its publication, the Statewide Training and Education Advisory Committee (STEAC) and the State Board of Fire Services (SBFS) recommended this CTS guide for adoption by the Office of the State Fire Marshal (OSFM).

Cover photo courtesy of Chris Johns, Firefighter, Orange County Fire Authority.

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How to Read a CTS Guide

Overview

A certification training standard (CTS) guide lists the requisite knowledge, skills, and job performance requirements an individual must complete to become certified in a specific job function.

It also documents and justifies the OSFM-approved revisions to the certification's NFPA standard and identifies where each certification training standard is taught (course plan), tested (skill sheets), and validated (task book).

Individuals aspiring to meet State Fire Training's certification training standards must do so in accordance with the codes, standards, regulations, policies, and standard operating procedures applicable within their own agency or jurisdiction.

Format

Each certification training standard is comprised of eight sections.

Section Heading

Training standards are grouped by section headings that describe a general category. For example, the Fire Fighter 1 CTS guide includes the following section headings: NFPA Requirements, Fire Department Communications, Fireground Operations, and Preparedness and Maintenance.

Training Standard Title

The training standard title provides a general description of the performance requirement contained within the individual standard.

Authority

The CTS guide references each individual standard with one or more paragraphs of the corresponding National Fire Protection Association (NFPA) Professional Qualifications. This ensures that each fire service function within California's certification system meets or exceeds NFPA standards.

When California requirements exceed the NFPA standard, the CTS guide cites the Office of the State Fire Marshal as the authority and prints the corresponding information in *italics*.

Job Performance Requirements

This segment includes a written statement that describes a specific job-related task, the items an individual needs to complete the task, and measurable or observable outcomes.

Requisite Knowledge

This segment lists the knowledge that an individual must acquire to accomplish the job performance requirement.

Requisite Skills

This segment lists the skills that an individual must acquire to accomplish the job performance requirement.

Content Modification

This table documents and justifies any revisions to the NFPA standard that the development or validation cadres make during the development of a CTS guide.

Cross Reference

This table documents where each training standard is taught (course plan), tested (skill sheets), and validated (task book).

Trench Rescue Technician

Section 1: Awareness

1-1: Interviewing Witnesses

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.1.1

Job Performance Requirement

Interview any witness or "competent person," given a specific trench collapse incident, so that potential for rapid, nonentry rescue or victim self-rescue is recognized.

Requisite Knowledge

- 1. Describe the need to secure "competent person" or witness
- 2. Identify signs and evidence of victim involvement, number, and location

Requisite Skills

- 1. Determine severe environmental conditions with implications for secondary collapse and victim survivability
- 2. Use interview techniques

Content Modification

Block	Modification	Justification
RS2	Added "use".	NFPA did not provide a verb.

Course Plan	Training Record	Task Book
Trench Rescue	Trench Rescue	Trench Rescue Technician (2021)
Technician (2021)	Technician (2021)	Instructor Task Book
 Topic 4-3 	• Skill 2	• JPR 10

1-2: Facilitating a Non-Entry Rescue or Victim Self-Rescue

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.1.2

Job Performance Requirement

Facilitate a non-entry rescue or victim self-rescue, given a trench collapse incident, tools used for self-rescue, and the rescue area and general area are made safe, so that the non-entry and self-rescue tactics can be initiated.

Requisite Knowledge

- 1. Understand mechanics and extent of collapse effects
- 2. Describe the need to brief rescuers
- 3. *Describe* criteria for rapid, non-entry rescues

Requisite Skills

- 1. Implement non-entry rescue and self-rescue tactics
- 2. Select and deploy tools used to facilitate non-entry and self-rescue
- 3. Reduce imposed loads at or near the lip of the trench

Content Modification

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician		Trench Rescue Technician (2021) Instructor
(2021)	N/A	Task Book
 Topic 6-1 		• JPR 20

1-3: Identifying Hazardous Areas

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.1.3

Job Performance Requirement

Identify hazardous areas specific to a trench environment, given a trench collapse incident, so that the scene is secured, hazards are managed, and an approach path to the trench is identified.

Requisite Knowledge

- 1. Identify areas at risk for increased likelihood of collapse
- 2. Identify general collapse patterns of trenches
- 3. Describe methods of bridging and weight distribution
- 4. *Describe* securing of scenes
- 5. Describe tactics for approaching the trench while minimizing the likelihood of collapse

Requisite Skills

- 1. Identify areas of high risk for additional collapse
- 2. Select and deploy tools or materials for bridging or weight distribution
- 3. Communicate high-risk areas to other responders

Content Modification

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician	Trench Rescue	Trench Rescue Technician (2021)
(2021)	Technician (2021)	Instructor Task Book
 Topic 3-3 (RK1, RK2, 	• Skill 5	• JPR 13
RS1)		
 Topic 4-6 (RK3, RK4, 		
RK5, RS2, RS3)		

1-4: Sizing Up a Trench Rescue Incident

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.1.4

Job Performance Requirement

Size up a trench rescue incident, given background information and applicable reference materials, so that the scope of the rescue is determined, the number of victims is identified, the last reported location of all the victims is established, witnesses and reporting parties are identified and interviewed, resource needs are assessed, primary search parameters are identified, and information required to develop an initial incident action plan is obtained.

Requisite Knowledge

- 1. Identify types of reference materials and their uses
- 2. *Identify* availability and capability of the resources
- 3. *Identify* elements of an incident action plan and related information
- 4. Describe the relationship of the size-up to the incident management system
- 5. *Identify* information gathering techniques and how that information is used in the size-up process
- 6. Describe basic search criteria for trench rescue incidents

Requisite Skills

- 1. Read technical rescue reference materials
- 2. Gather information
- 3. Use interview techniques
- 4. Relay information
- 5. Use information-gathering sources

Content Modification

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue	Trench Rescue	Trench Rescue Technician (2021)
Technician (2021)	Technician (2021)	Instructor Task Book
 Topic 4-4 	• Skill 3	• JPR 11

1-5: Recognizing Incident Hazards and Initiating Isolation Procedures

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.1.5

Job Performance Requirement

Recognize incident hazards and initiate isolation procedures, given scene control barriers, personal protective equipment (PPE), requisite equipment, and available specialized resources, so that all hazards are identified; resource application fits the operational requirements; hazard isolation is considered; risks to rescuers, bystanders, and victims are minimized; and rescue time constraints are taken into account.

Requisite Knowledge

- 1. Describe resource capabilities and limitations
- 2. Describe types and nature of incident hazards
- 3. Identify equipment types and their use
- 4. Describe isolation terminology, methods, equipment, and implementation
- 5. Identify operational requirement concerns
- 6. Describe common types of rescuer and victim risks
- 7. Describe risk/benefit analysis methods and practices
- 8. Describe hazard recognition, isolation methods, and terminology
- 9. Describe methods for controlling access to the scene
- 10. Identify types of technical references

Requisite Skills

- 1. Identify resource capabilities and limitations
- 2. Identify incident hazards
- 3. Assess potential hazards to rescuers and bystanders
- 4. Place scene control barriers
- 5. Operate control and mitigation equipment

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician (2021)	Trench Rescue	Trench Rescue Technician
 Topic 4-1 (RK3, RS5) 	Technician (2021)	(2021) Instructor Task Book
 Topic 4-4 (RK1, RK7, RK10, 	Skill 6	• JPR 13
RS1)	• Skill 7	
 Topic 4-5 (RK5) 		
 Topic 4-6 (RK2, RK4, RK6, 		
RK8, RK9, RS2, RS3, RS4)		

1-6: Recognizing the Need for Technical Rescue Resources

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.1.6

Job Performance Requirement

Recognize the need for technical rescue resources at an operations- or technician-level incident, given AHJ guidelines, so that the need for additional resources is identified, the response system is initiated, the scene is secured and rendered safe until additional resources arrive, and awareness-level personnel are incorporated into the operational plan.

Requisite Knowledge

- 1. Describe operational protocols
- 2. Identify specific planning forms
- 3. Describe types of incidents common to the AHJ
- 4. Identify hazards
- 5. Identify types of resources
- 6. Identify needed resources
- 7. Describe incident support operations and resources
- 8. Describe safety measures

Requisite Skills

- 1. Apply operational protocols
- 2. Select specific planning forms based on the types of incidents
- 3. Identify and evaluate various types of hazards within the AHJ
- 4. Request support and resources
- 5. Determine the required safety measures

Content Modification

Block	Modification	Justification
RK 5	Added new knowledge item.	Not addressed by NFPA. (2021)
RK 6	Added new knowledge item.	Not addressed by NFPA. (2021)

Course Plan	Training Record	Task Book
Trench Rescue Technician (2021)	Trench Rescue	Trench Rescue Technician
 Topic 4-2 (RK3) 	Technician (2021)	(2021) Instructor Task Book
 Topic 4-5 (RK1, RK2, RK5, 	• Skill 4	• JPR 12
RK6, RK7, RS1, RS2, RS4)		
 Topic 4-6 (RK4, RS3) 		

1-7: Supporting an Operations- or Technician-level Incident

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.1.7

Job Performance Requirement

Support an operations- or technician-level incident, given an incident, an assignment, an incident action plan, and resources from the tool kit, so that the assignment is carried out, progress is reported to command, environmental concerns are managed, personnel rehabilitation is facilitated, and the incident action plan is supported.

Requisite Knowledge

- 1. Describe AHJ operational protocols
- 2. Describe hazard recognition
- 3. Describe incident management
- 4. Describe PPE selection
- 5. Describe resource selection and use
- 6. Describe scene support requirements

Requisite Skills

- 1. Apply operational protocols
- 2. Function within an incident management system
- 3. Follow and implement an incident action plan
- 4. Report the task progress status to a supervisor or incident command

Content Modification

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician	Trench Rescue	Trench Rescue Technician (2021)
(2021)	Technician (2021)	Instructor Task Book
 Topic 4-1 (RK4) 	• Skill 9	• JPR 15
• Topic 4-5 (RK1, RK5)		
 Topic 4-6 (RK2) 		
 Topic 4-8 (RK3, RK6, 		
RS1, RS2, RS3, RS4)		

1-8: Standards and Regulations

Authority

1. Office of the State Fire Marshal

Job Performance Requirement

Carry out trench rescue operations, given OSHA and Cal/OSHA standards and AHJ policies and procedures, so that trench rescue operations are completed in accordance with federal, state, and local standards, regulations, policies, and procedures.

Requisite Knowledge

- 1. Identify federal standard for trenching and excavations
- 2. Describe California standard for trenching and excavations
- 3. *Identify* other regulations that may impact trenching operations
- 4. Identify consequences related to regulatory non-compliance

Requisite Skills

1. None

Content Modification

Block	Modification	Justification
JPR	Added new job performance	California has specific standards and regulations for
	requirement.	trench rescue operations.

Course Plan	Training Record	Task Book
Trench Rescue Technician		Trench Rescue Technician (2021)
(2021)	N/A	Instructor Task Book
• Topic 2-2		• JPR 4

Section 2: Operations

2-1: Identifying Potential Hazards to Victims and Rescuers

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.2.1

Job Performance Requirement

Identify potential hazards to victims and rescuers in and around a trench excavation, given a trench collapse incident, a trench rescue toolkit so that potential areas of additional collapse in the trench are identified, utility lines are located, spoil piles are monitored, additional superimposed weight is identified, sources of atmospheric contamination are assessed, sources of water are identified, and environmental hazards are considered.

Requisite Knowledge

- 1. *Describe* methods to distinguish soil types, collapse mechanics, and other contributing factors such as severe environmental conditions and other general hazards
- 2. Describe effects and hazards of collapse and rescue efforts on utilities at the incident site
- 3. Identify jurisdictional and community resource lists and agreements
- 4. Describe atmospheric monitoring
- 5. Describe effects of additional superimposed weight and vibrations on trench walls
- 6. Describe effects of water in and around trench

Requisite Skills

- 1. Interpret tabulated data information and tables
- 2. Perform atmospheric monitoring
- 3. Monitor spoil piles
- 4. Assess and address the effects of water on trench stability

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician (2021)	Trench Rescue Technician	Trench Rescue
 Topic 3-1 (RK1) 	(2021)	Technician (2021)
 Topic 4-4 (RS1) 	• Skill 1	Instructor Task Book
 Topic 4-5 (RK3) 	• Skill 5	• JPR 13
 Topic 4-6 (RK2, RK4, RK5, 		
RK6, RS2, RS3, RS4)		
 Topic 5-2 (RS1) 		

2-2: Implementing a Hazard Control Plan

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.2.2

Job Performance Requirement

Implement a hazard control plan given a trench collapse incident, hazard control plan and trench rescue tool kit so that provisions for ventilation, dewatering, energy control, air monitoring; and falls, and prevention of unplanned soil movement are accomplished.

Requisite Knowledge

- 1. Describe protocols on making the general area safe
- 2. Describe criteria for a safe zone within the trench
- 3. Describe atmospheric monitoring and ventilation
- 4. Describe types of collapses and techniques to stabilize
- 5. *Describe* emergency procedures
- 6. Describe selection of PPE
- 7. Describe consideration of selected stabilization tactics on extrication and victim safety

Requisite Skills

- 1. Employ hazard control plan to protect personnel inside and outside of trench
- 2. Establish safe zones
- 3. Perform atmospheric monitoring and initiate ventilation as needed
- 4. Initiate dewatering
- 5. Provide energy control
- 6. Select and use PPE
- 7. Apply fall prevention
- 8. Implement strategies to minimize unplanned soil movement

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician (2021)	Trench Rescue	Trench Rescue Technician
 Topic 3-3 (RK4) 	Technician (2021)	(2021) Instructor Task Book
 Topic 4-1 (RK6, RS6) 	• Skill 6	• JPR 13
 Topic 4-6 (RK1, RK2, RK3, RK5, 		
RS1, RS2, RS3, RS4, RS5, RS7,		
RS8)		
• Topic 5-2 (RK7)		

2-3: Developing a Shoring Plan for a Nonintersecting Trench

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.2.3

Job Performance Requirement

Develop a shoring plan for a nonintersecting trench no more than 8 ft (2.4 m) deep, given a trench collapse incident and trench rescue tool kit, so that the methods of potential collapse are recognized, the mechanisms of entrapment are identified, areas of the trench that are blown out or undercut are addressed, related tabulated data is consulted, the weights and hazards associated with the soils are considered, and the location of the victim and projected path for removal are incorporated.

Requisite Knowledge

- 1. Describe shoring and shielding
- 2. Describe how to interpret tabulated data
- 3. Describe strategies and tactics
- 4. Describe protocols on making the general area safe
- 5. Describe criteria for a safe zone within the trench
- 6. Describe types of collapses and techniques to stabilize
- 7. Describe emergency procedure
- 8. Describe selection of personal protective equipment
- 9. Describe consideration of selected stabilization tactics on extrication and victim safety

Requisite Skills

- 1. Determine shoring strategies
- 2. Designate cut station location, and material and equipment needs
- 3. Establish safe zones
- 4. Pre-brief team on shoring strategies, victim release, and projected path for removal

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician	Trench Rescue	Trench Rescue Technician (2021)
(2021)	Technician (2021)	Instructor Task Book
• Topic 3-3 (RK6)	• Skill 10	• JPR 5
• Topic 4-1 (RK8)		• JPR 6
• Topic 5-1 (RK1)		• JPR 7
 Topic 5-2 (RK2, RK3, 		• JPR 8
RK9, RS1)		
 Topic 5-3 (RK4, RK5, 		
RK7, RS2, RS3, RS4)		

2-4: Implementing a Trench Shoring Plan for a Nonintersecting Trench

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.2.4

Job Performance Requirement

Implement a trench shoring plan for a nonintersecting trench no more than 8 ft (2.4 m) deep, given a trench collapse incident, trench shoring plan, and a trench rescue tool kit, so that the victim is protected from additional collapse, the trench walls are supported, prior areas of collapse are addressed, shoring team members work from protected areas, and shoring systems are installed so they perform their intended function.

Requisite Knowledge

- 1. Describe shoring and shielding
- 2. Describe criteria for a safe zone within the trench
- 3. Describe types of collapse and techniques to stabilize
- 4. Describe emergency procedures
- 5. Describe selection of personal protective equipment
- 6. Describe consideration of selected stabilization tactics for extrication and victim safety

Requisite Skills

- 1. Place shoring and shielding systems
- 2. Install supplemental shoring
- 3. Use protocols
- 4. Choose methods to stabilize
- 5. Establish a cut station
- 6. Use personal protective equipment
- 7. Anticipate extrication logistics
- 8. Create systems in trenches 8 ft (2.4 m) deep

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician (2021)	Trench Rescue	Trench Rescue Technician
 Topic 3-3 (RK3) 	Technician (2021)	(2021) Instructor Task Book
 Topic 4-1 (RK5, RS6) 	• Skill 13	• JPR 18
• Topic 5-1 (RK1)	• Skill 14	
 Topic 5-2 (RK6, RS4) 	• Skill 15	
 Topic 5-3 (RK2, RK4, RS1, 	• Skill 16	
RS2, RS3, RS5, RS7, RS8)		

2-5: Releasing a Victim from Soil Entrapment in a Nonintersecting Trench

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.2.5

Job Performance Requirement

Release a victim from soil entrapment in a nonintersecting trench of 8 ft (2.4 m) or less in depth, given a trench collapse incident and a trench rescue tool kit, so that hazards to rescue personnel and victims are minimized; considerations are given to the victim's injuries, crush injuries related to compartment syndrome, and other injuries; techniques are used to enhance patient survivability; and techniques do not compromise the integrity of the existing trench shoring system.

Requisite Knowledge

- 1. Describe identification, utilization, and required care of personal equipment
- 2. Describe general hazards associated with each type of trench collapse
- 3. Describe methods of evaluating shoring systems and trench wall stability
- 4. Describe compartment syndrome protocols
- 5. Describe identification of collapse characteristics
- 6. Describe causes and associated effects of trench collapse
- 7. Describe potential signs of subsequent collapse
- 8. Describe selection and application of rescue tools and resources
- 9. Describe risk/benefit assessment techniques for extrication methods
- 10. Describe time constraints

Requisite Skills

- 1. Select, use, and care for PPE
- 2. Operate rescue tools and stabilization systems
- 3. Identify crush injuries related to compartment syndrome
- 4. Complete risk/benefit assessments for selected methods of rescue and time constraints

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician	Trench Rescue	Trench Rescue Technician (2021)
(2021)	Technician (2021)	Instructor Task Book
 Topic 3-3 (RK5, RK6, 	• Skill 23	• JPR 21
RK7)	• Skill 24	
 Topic 4-1 (RK1, RK8, 		
RS1, RS2)		
 Topic 4-6 (RK2) 		
 Topic 6-2 (RK3, RK4, 		
RK9, RK10, RS3, RS4)		

2-6: Removing a Victim from a Trench

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.2.6

Job Performance Requirement

Remove a victim from a trench, given a disentangled victim, a basic first aid kit, and victim packaging resources, so that basic life functions are supported as required; the victim is evaluated for signs of compartment syndrome; methods and packaging devices selected are compatible with intended routes of transfer; universal precautions are employed to protect personnel from blood-borne pathogens; and extraction times meet time constraints for medical management.

Requisite Knowledge

- 1. Describe medical protocols
- 2. Describe available medical resources
- 3. Describe transfer methods and time needed to execute
- 4. Describe universal precautions protocol
- 5. Describe rope rescue systems
- 6. Describe high-point anchor options
- 7. Describe patient ladder raise removal techniques

Requisite Skills

- 1. Select and use personal protective equipment
- 2. Provide basic medical care and immobilization techniques
- 3. Identify the need for advanced life support and compartment syndrome management
- 4. Use a removal system that matches logistical and medical management time frame concerns

Content Modification

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician (2021)	Trench Rescue	Trench Rescue Technician
 Topic 4-1 (RS1) 	Technician (2021)	(2021) Instructor Task Book
 Topic 6-2 (RK1, RK2, RK3, RK4, 	• Skill 25	• JPR 21
RK5, RK6, RK7, RS2, RS3, RS4)	• Skill 26	
	• Skill 27	

2-7: Disassembling Support Systems

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.2.7

Job Performance Requirement

Disassemble support systems at a trench emergency incident, given personal protective equipment, trench tool kit, and removal of victim(s), so that soil movement is minimized, all rescue equipment is removed from the trench, sheeting and shoring are removed in the reverse order of their placement, emergency protocols and safe zones in the trench are adhered to, rescue personnel are removed from the trench, the last supporting shores are pulled free with ropes, equipment is cleaned and serviced, reports are completed, and a post-briefing is performed.

Requisite Knowledge

- 1. Describe selection of personal protective equipment
- 2. Describe equipment used and its location
- 3. Describe shoring and shielding tactics and order of placement
- 4. Describe shoring removal protocols
- 5. Describe criteria for a "safe zone" within the trench
- 6. Describe personnel accountability
- 7. Describe emergency procedures
- 8. Describe manufacturer's recommended care and maintenance procedures
- 9. Describe briefing protocols

Requisite Skills

- 1. Use personal protective equipment
- 2. Remove equipment and protective systems
- 3. Use trench safety protocols
- 4. Clean and service equipment
- 5. Perform an incident debriefing

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician (2021)	Trench Rescue	Trench Rescue Technician
 Topic 4-1 (RK1, RS1) 	Technician (2021)	(2021) Instructor Task Book
 Topic 6-3 (RK2, RK3, RK4, RK5, 	• Skill 28	• JPR 22
RK6, RK7, RK8, RK9, RS2, RS3,		
RS4, RS5)		

2-8: Terminating a Technical Rescue Operation

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.2.8

Job Performance Requirement

Terminate a technical rescue operation, given an incident scenario, assigned resources, and site safety data, so that rescuer risk and site safety are managed; scene security is maintained and custody transferred to a responsible party; personnel and resources are returned to a state of readiness; record-keeping and documentation occur; and post-event analysis is conducted.

Requisite Knowledge

- 1. Describe incident command functions and resources
- 2. Describe hazard identification and risk management strategies
- 3. Describe logistics and resource management
- 4. Describe personnel accountability systems
- 5. Describe AHJ-specific procedures or protocols related to personnel rehab

Requisite Skills

- 1. Recognize hazards
- 2. Analyze risk
- 3. Use site control equipment and methods
- 4. Use data collection and management systems
- 5. Use asset and personnel tracking systems

Content Modification

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue	Trench Rescue	Trench Rescue Technician (2021)
Technician (2021)	Technician (2021)	Instructor Task Book
• Topic 6-3	• Skill 29	• JPR 22
	• Skill 30	
	• Skill 31	
	• Skill 32	

Section 3: Technician

3-1: Developing a Shoring Plan for an Intersecting Trench

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.3.1

Job Performance Requirement

Develop a shoring plan for an intersecting trench, given a trench collapse incident and trench rescue tool kit, so that the methods of potential collapse are recognized, the mechanisms of entrapment are identified, areas of the trench that are blown out or undercut are addressed, related tabulated data is consulted, the weights and hazards associated with the soils are considered, and the location of the victim and projected path for removal are incorporated.

Requisite Knowledge

- 1. Describe shoring and shielding
- 2. Describe how to interpret tabulated data
- 3. Describe strategies and tactics
- 4. Describe protocols on making the general area safe
- 5. Describe criteria for a safe zone within the trench
- 6. Describe types of collapses and techniques to stabilize
- 7. Describe emergency procedures
- 8. Describe selection of PPE
- 9. Describe consideration of selected stabilization tactics for extrication and victim safety

Requisite Skills

- 1. Determine shoring strategies
- 2. Designate cut station location and material and equipment needs
- 3. Establish safe zones
- 4. Pre-brief team on shoring strategies, victim release, and projected path for removal

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician	Trench Rescue	Trench Rescue Technician (2021)
(2021)	Technician (2021)	Instructor Task Book
 Topic 3-3 (RK6) 	• Skill 11	• JPR 5
 Topic 4-1 (RK8) 		• JPR 6
• Topic 5-1 (RK1)		• JPR 7
 Topic 5-2 (RK2, RK3, 		• JPR 17
RK9, RS1)		
 Topic 5-3 (RK4, RK5, 		
RK7, RS2, RS3, RS4)		

3-2: Implementing a Trench Shoring Plan for an Intersecting Trench

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.3.2

Job Performance Requirement

Implement a trench shoring plan for intersecting trench, given a trench collapse incident, trench shoring plan, and a trench rescue tool kit, so that the victim is protected from additional collapse, the trench walls are supported, prior areas of collapse are addressed, shoring team members work from protected areas, and shoring systems are installed so they perform their intended function.

Requisite Knowledge

- 1. Describe shoring and shielding
- 2. Describe criteria for a safe zone within the trench
- 3. Describe types of collapses and techniques to stabilize
- 4. Describe emergency procedures
- 5. Describe selection of PPE
- 6. Describe consideration of selected stabilization tactics on extrication and victim safety.

Requisite Skills

- 1. Place shoring and shielding systems
- 2. Install supplemental shoring
- 3. Use protocols
- 4. Choose methods to stabilize
- 5. Establish a cut station
- 6. Use personal protective equipment
- 7. Anticipate extrication logistics
- 8. Create shoring systems in trenches 8 ft (2.4 m) deep

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician (2021)	Trench Rescue	Trench Rescue Technician
 Topic 3-3 (RK3) 	Technician (2021)	(2021) Instructor Task Book
 Topic 4-1 (RK5, RS6) 	• Skill 13	• JPR 18
• Topic 5-1 (RK1)	• Skill 14	
 Topic 5-2 (RK6, RS4) 	• Skill 15	
 Topic 5-3 (RK2, RK4, RS1, 	• Skill 17	
RS2, RS3, RS5, RS7, RS8)		

3-3: Developing a Shoring Plan for a Trench More than 8 Feet Deep

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.3.3

Job Performance Requirement

Develop a shoring plan for a trench more than 8 ft (2.4 m) deep, given a trench collapse incident, and trench rescue tool kit, so that the methods of potential collapse are recognized, the mechanisms of entrapment are identified, areas of the trench that are blown out or undercut are addressed, related tabulated data is consulted, the weights and hazards associated with the soils are considered, the location of the victim and projected path for removal are incorporated.

Requisite Knowledge

- 1. Describe shoring and shielding
- 2. Describe how to interpret tabulated data
- 3. Describe strategies and tactics
- 4. Describe protocols on making the general area safe
- 5. Describe criteria for a safe zone within the trench
- 6. Describe types of collapses and techniques to stabilize
- 7. Describe emergency procedures
- 8. Describe selection of PPE
- 9. Describe consideration of selected stabilization tactics on extrication and victim safety

Requisite Skill

- 1. Determine shoring strategies
- 2. Designate cut station location and material and equipment needs
- 3. Establish safe zones
- 4. Pre-brief team on shoring strategies, victim release, and projected path for removal

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician	Trench Rescue	Trench Rescue Technician (2021)
(2021)	Technician (2021)	Instructor Task Book
 Topic 3-3 (RK6) 	• Skill 12	JPR 5
 Topic 4-1 (RK8) 		• JPR 6
 Topic 5-1 (RK1) 		• JPR 7
 Topic 5-2 (RK2, RK3, 		• JPR 17
RK9, RS1)		
 Topic 5-3 (RK4, RK5, 		
RK7, RS2, RS3, RS4)		

3-4: Implementing a Trench Shoring Plan for a Trench More than 8 Feet Deep

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.3.4

Job Performance Requirement

Implement a trench shoring plan for a trench more than 8 ft (2.4 m) deep, given a trench collapse incident, trench shoring plan, and a trench rescue tool kit, so that the victim is protected from additional collapse, the trench walls are supported, prior areas of collapse are addressed, shoring team members work from protected areas, and shoring systems are installed so they perform their intended function.

Requisite Knowledge

- 1. Describe shoring and shielding
- 2. Describe criteria for a safe zone within the trench
- 3. Describe types of collapses and techniques to stabilize
- 4. *Describe* emergency procedures
- 5. Describe selection of personal protective equipment
- 6. Describe consideration of selected stabilization tactics on extrication and victim safety

Requisite Skills

- 1. Place shoring and shielding systems
- 2. Install supplemental shoring
- 3. Use protocols
- 4. Choose methods to stabilize
- 5. Establish a cut station
- 6. Use personal protective equipment
- 7. Anticipate extrication logistics
- 8. Create systems in trenches more than 8 ft (2.4 m) deep

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician (2021)	Trench Rescue	Trench Rescue Technician
 Topic 3-3 (RK3) 	Technician (2021)	(2021) Instructor Task Book
 Topic 4-1 (RK5, RS6) 	• Skill 13	• JPR 18
• Topic 5-1 (RK1)	• Skill 14	
• Topic 5-2 (RK6, RS4)	• Skill 15	
 Topic 5-3 (RK2, RK4, RS1, 	• Skill 18	
RS2, RS3, RS5, RS7, RS8)		

3-5: Supporting an Intersecting Trench as a Member of a Team

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.3.5

Job Performance Requirement

Support an intersecting trench as a member of a team, given size-up information and an action plan, a trench tool kit, and an assignment, so that strategies to minimize the further movement of soil are implemented effectively; trench walls, lip, and spoil pile are monitored continuously; rescue entry team(s) in the trench remains in a safe zone; any slough-in and wall shears are mitigated; emergency procedures and warning systems are established and understood by participating personnel; incident-specific personal protective equipment is utilized; physical hazards are identified and managed; victim protection is maximized; victim extrication methods are considered; and a rapid intervention team is staged.

Requisite Knowledge

- 1. Describe shoring and shielding
- 2. Describe how to interpret tabulated data
- 3. Describe strategies and tactics
- 4. Describe types of intersecting trenches and techniques to stabilize
- 5. Describe protocols on making the general area safe
- 6. Describe criteria for safe zones in the trench
- 7. Describe types of collapses and techniques to stabilize
- 8. Describe emergency procedures
- 9. Describe selection of personal protective equipment
- 10. Describe consideration of selected stabilization tactics on extrication and victim safety

Requisite Skills

- 1. Interpret tabulated data information and tables
- 2. Place shoring and shielding systems
- 3. Identify type of intersecting trench
- 4. Use trench rescue protocols
- 5. Identify types of collapse and methods to stabilize
- 6. Identify hazards in a trench
- 7. Use personal protective equipment
- 8. Anticipate extrication logistics

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician	Trench Rescue	Trench Rescue Technician (2021)
(2021)	Technician (2021)	Instructor Task Book
 Topic 3-2 (RK4) 	• Skill 20	• JPR 19
 Topic 3-3 (RK7, RS5) 		
 Topic 4-1 (RK9, RS7) 		
 Topic 4-6 (RS6) 		
 Topic 5-1 (RK1, RS3) 		
 Topic 5-2 (RK2, RK3, 		
RK10, RS1)		
 Topic 5-3 (RK5, RK6, 		
RK8, RS2, RS4, RS8)		

3-6: Installing Supplemental Sheeting and Shoring Below an Existing Approved Shoring System

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.3.6

Job Performance Requirement

Install supplemental sheeting and shoring for each 2 ft (0.61 m) of depth dug below an existing approved shoring system, given size-up information, an action plan, and a trench tool kit, so that the movement of soil is minimized effectively, initial trench support strategies are facilitated, rescue entry team safe zones are maintained, excavation of entrapping soil is continued, victim protection is maximized, victim extrication methods are considered, and a rapid intervention team is staged.

Requisite Knowledge

- 1. Describe shoring and shielding
- 2. Describe how to interpret tabulated data
- 3. Describe strategies and tactics
- 4. Describe methods and techniques to install supplemental sheeting and shoring
- 5. Describe protocols on making the general area safe
- 6. Describe criteria for safe zones in the trench
- 7. Describe types of collapses and techniques to stabilize
- 8. Describe emergency procedures
- 9. Describe selection of personal protective equipment
- 10. Describe consideration of selected stabilization tactics on extrication and victim safety

Requisite Skills

- 1. Interpret tabulated data information and tables
- 2. Place shoring and shielding systems
- 3. Identify supplemental sheeting and shoring
- 4. Use all trench rescue protocols
- 5. Identify types of collapse and methods to stabilize
- 6. Identify exposure to hazards within the trench relative to existing safe zones
- 7. Select and use personal protective equipment
- 8. Anticipate extrication logistics

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician (2021)	Trench Rescue	Trench Rescue Technician
 Topic 3-3 (RK7, RS5) 	Technician (2021)	(2021) Instructor Task Book
 Topic 4-1 (RK9, RS7) 	• Skill 18	• JPR 18
 Topic 5-1 (RK1) 		
 Topic 5-2 (RK2, RK3, RK10, RS1) 		
 Topic 5-3 (RK4, RK5, RK6, 		
RK8, RS2, RS3, RS4, RS6,		
RS8)		

3-7: Utilizing Spot Shoring Techniques to Support Soil

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.3.7

Job Performance Requirement

Utilize spot shoring techniques to support soil without incorporating uprights or panels as part of the shoring plan, given a trench incident, trench rescue toolbox, tabulated data, and trench shoring plan, so that the soil is prevented from collapse.

Requisite Knowledge

- 1. Describe shoring and shielding
- 2. Describe how to interpret tabulated data
- 3. Describe strategies and tactics
- 4. Describe methods and techniques to install supplemental sheeting and shoring
- 5. Describe protocols on making the general area safe
- 6. Describe criteria for safe zones in the trench
- 7. Describe types of collapses and techniques to stabilize
- 8. Describe emergency procedures
- 9. Describe selection of personal protective equipment
- 10. Describe consideration of selected stabilization tactics on extrication and victim safety

Requisite Skills

- 1. Interpret tabulated data information and tables
- 2. Place shoring and shielding systems
- 3. Identify supplemental sheeting and shoring
- 4. Use all trench rescue protocols
- 5. Identify types of collapse and methods to stabilize
- 6. Identify exposure to hazards within the trench relative to existing safe zones
- 7. Select and use personal protective equipment
- 8. Anticipate extrication logistics

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician (2021)	Trench Rescue	Trench Rescue Technician
 Topic 3-3 (RK7, RS5) 	Technician (2021)	(2021) Instructor Task Book
 Topic 4-1 (RK9, RS7) 	• Skill 19	• JPR 18
• Topic 5-1 (RK1)		
• Topic 5-2 (RK2, RK3, RK10,		
RS1)		
 Topic 5-3 (RK4, RK5, RK6, 		
RK8, RS2, RS3, RS4, RS6,		
RS8)		

3-8: Constructing Load Stabilization Systems

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.3.8

Job Performance Requirement

Construct load stabilization systems, given an assignment, personal protective equipment, and a trench tool kit, so that the stabilization system will support the load safely, the system is stable, and the assignment is completed.

Requisite Knowledge

- 1. Describe different types of stabilization systems and their construction methods
- 2. Describe limitations of the system
- 3. Describe load calculations
- 4. Describe principles of and applications for stabilization systems
- 5. Describe safety considerations

Requisite Skills

- 1. Select and construct stabilization systems
- 2. Evaluate structural integrity of the system
- 3. Determine stability, and calculate loads

Content Modification

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue	Trench Rescue	Trench Rescue Technician (2021)
Technician (2021)	Technician (2021)	Instructor Task Book
• Topic 6-2	• Skill 21	• JPR 21

3-9: Lifting a Load with a Trench Tool Kit

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.3.9

Job Performance Requirement

Lift a load, given a trench tool kit, so that the load is lifted the required distance to gain access; settling or dropping of the load is prevented; control and stabilization are maintained before, during, and after the lift; and operational objectives are attained.

Requisite Knowledge

- 1. Describe applications of levers
- 2. Describe classes of levers
- 3. Describe principles of leverage, gravity, and load balance
- 4. Describe resistance force
- 5. Describe mechanics and types of load stabilization
- 6. Describe mechanics of load lifting
- 7. Describe application of pneumatic, hydraulic, mechanical, and manual lifting tools
- 8. Describe how to calculate the weight of the load
- 9. Describe safety protocols

Requisite Skills

- 1. Evaluate and estimate the weight of the load
- 2. Operate the tools correctly
- 3. Operate a lever
- 4. Apply load stabilization systems

Content Modification

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue	Trench Rescue	Trench Rescue Technician (2021)
Technician (2021)	Technician (2021)	Instructor Task Book
• Topic 6-2	• Skill 22	• JPR 21

3-10: Coordinating Heavy Equipment Use

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.3.10

Job Performance Requirement

Coordinate the use of heavy equipment, given personal protective equipment, means of communication, equipment, operator, and an assignment, so that operator capabilities and limitations for task are evaluated, common communications are maintained, equipment usage supports the operational objectives, and hazards are avoided.

Requisite Knowledge

- 1. Describe types of heavy equipment
- 2. Describe capabilities, application, and hazards of heavy equipment and rigging
- 3. Describe how to confirm operator training
- 4. Describe types of communication
- 5. Describe methods to establish communications

Requisite Skills

- 1. Use hand signals
- 2. Use radio equipment
- 3. Recognize hazards
- 4. Assess operator for skill and calm demeanor
- 5. Assess heavy equipment for precision of movement and maintenance
- 6. Monitor rescuer and victim safety
- 7. Use personal protective equipment

Content Modification

Block	Modification	Justification

Course Plan	Training Record	Task Book
Trench Rescue Technician (2021)	Trench Rescue	Trench Rescue Technician
 Topic 4-1 (RS7) 	Technician (2021)	(2021) Instructor Task Book
 Topic 4-7 (RK1, RK2, RK3, RK4, 	• Skill 8	• JPR 14
RK5, RS1, RS2, RS3, RS4, RS5,		
RS6)		

3-11: Releasing a Victim from Entrapment

Authority

- 1. NFPA 1006: Standard for Technical Rescue Personnel Professional Qualifications (2021)
 - Paragraph 12.3.11

Job Performance Requirement

Release a victim from entrapment by components of a collapsed trench, given personal protective equipment, a trench rescue tool kit, and specialized equipment, so that hazards to rescue personnel and victims are minimized, considerations are given to compartment syndrome related to crush injuries and other injuries, techniques are used to enhance patient survivability, tasks are accomplished within projected time frames, and techniques do not compromise the integrity of the existing trench shoring system.

Requisite Knowledge

- 1. Describe identification, utilization, and required care of personal equipment
- 2. Describe general hazards associated with each type of trench collapse
- 3. Describe methods of evaluating shoring systems and trench wall stability
- 4. Describe compartment syndrome protocols
- 5. Describe identification of collapse characteristics
- 6. Describe causes and associated effects of trench collapse
- 7. Describe potential signs of subsequent collapse
- 8. Describe selection and application of rescue tools and resources
- 9. Describe risk/benefit assessment techniques for extrication methods
- 10. Describe time constraints

Requisite Skills

- 1. Select, use, and care for personal protective equipment
- 2. Operate rescue tools and stabilization systems
- 3. Identify crush syndrome clinical settings
- 4. Complete risk/benefit assessments for selected methods of rescue and time constraints

Block	Modification	Justification
RK10	Changed "restraints" to "constraints".	Inconsistent with other items in chapter.

Course Plan	Training Record	Task Book
Trench Rescue Technician	Trench Rescue	Trench Rescue Technician (2021)
(2021)	Technician (2021)	Instructor Task Book
 Topic 3-3 (RK5, RK6, RK7) 	• Skill 23	• JPR 21
 Topic 4-1 (RK1, RK8, RS1, RS2) 		
 Topic 4-6 (RK2) 		
 Topic 6-2 (RK3, RK4, RK9, RK10, RS3, RS4) 		