

State of Oregon  
Department of Public Safety Standards and Training

# Trench Rescue Technician Task Book

Trench Rescue Technician Task Book Assigned To:	
Name	DPSST Fire Service #
Agency Name	Date Initiated

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Department of Public Safety Standards and Training  
4190 Aumsville Hwy. SE  
Salem, OR 97317  
503-378-2100

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<http://www.oregon.gov/DPSST>

# Trench Rescue Technician Signature Page

A copy of this signature page and documentation of the applicants training must be included with the DPSST Rescue Technician application when applying for NFPA Trench Rescue Technician certification. Do not send the entire Task Book. Only a certified Rescue Technician in that specialty area may sign off the Task Book.

**Attest:** The information contained in this Task Book is true and correct to the best of my knowledge. I understand that a false or misleading statement on this document is subject to penalty under ORS 162.055, et al, and ORS 162.305 and may be cause to deny or revoke a fire service professional certification.

<b><u>Trench Rescue Technician Task Book Assigned To:</u></b>		
<hr/> <b>Signature</b>	<hr/> <b>Printed Name</b>	<hr/> <b>DPSST Fire Service #</b>
<hr/> <b>Agency Name</b>	<hr/> <b>Date Initiated</b>	
<hr/> <b>Signature of Certified Technician</b>	<hr/> <b>Printed Name of Certified Technician</b>	<hr/> <b>Date Completed</b>

**Rescue Technician Evaluators:** Each Evaluator must document the following information:

<b>Evaluator:</b> Level of Rescue Technician certification:   ___Rope   ___Surface Water ___Vehicle & Machinery   ___Confined Space   ___Structural Collapse   ___Trench			
<b>Sections of chapter signed off by Evaluator:</b> ___2   ___3   ___9			
<hr/> <b>Signature of Evaluator</b>	<hr/> <b>Printed name of Evaluator</b>	<hr/> <b>DPSST Fire #</b>	<hr/> <b>Date</b>

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Task Book Qualification Record Books (Task Book) have been developed for various certification levels within the Oregon Department of Public Safety Standards and Training (DPSST) system. Each Task Book lists the job performance requirements (JPRs) for the specific certification level in a format that allows a candidate to be trained and evaluated in the skills of that position. Successful performance of all tasks, as observed and recorded by a certified Rescue Technician in that discipline, will result in the candidate's eligibility for DPSST certification.

To become certified at a specific level, the applicant must successfully complete all the job performance requirements. Before a job performance requirement may be taken, all requisite knowledge and skills must be satisfied. Only requisite knowledge and skills may be signed off in the classroom setting by the instructor. Only a certified Rescue Technician in that specialty rescue area may sign off all relative Task Book evaluations at the candidates agency. When all prescribed requirements are completed, an application for certification may be submitted to DPSST. All certificates are mailed to the Training Officer at the agency.

**Note to agencies:** It is highly recommended that an agency considering a Rescue Technician program reviews NFPA 1670 and follows those standards. These JPRs are general guidelines. As such they are not intended to replace specific sequences of apparatus or equipment operation that may be outlined by manufacturer specifications. At all times, standard operating procedures of the agency in which the evaluation is being conducted will govern. The agencies should have available for evaluators a copy of manufacturer specifications and the agency's standard operational guidelines.

The JPRs covered in this Task Book meet or exceed all NFPA published standards for this certification level at the time of this publication. Mention of NFPA and its standards do not, and are not intended as adoption of – or reference to – NFPA standards.

## HOW TO EVALUATE PERFORMANCE

Each JPR has a corresponding box to the right in which to confirm a candidate's success in a sequence. The evaluator shall indicate successful passing by the candidate of each JPR by initialing and dating. The candidate needs only perform the skill once to complete. These skills are to be tested after the candidate has completed the training program and by using the equipment of the agency. Testing in the training program does not constitute completion of the skill in a Task Book. Requisite knowledge and skills may be signed off in the training program.

- 3-3.7 Transfer a victim to emergency medical services (EMS), given local medical protocols, so that all pertinent information is passed from rescuer to EMS provider, and the victim can be transported to a medical care facility.

# Task Book Qualification Record

For the Certification Level of

## Trench Rescue Technician

Prior to becoming certified in this position, the candidate shall successfully complete the following Job Performance Requirements (JPR). The evaluator shall initial and date the appropriate box to indicate successful completion of each. For each JPR there are requisite knowledge and skill requirements. These requirements must be met before candidate may proceed.

- 2-1 Because technical rescue is inherently dangerous and rescue technicians are frequently required to perform rigorous activities in adverse conditions, regional and national safety standards shall be included in agency policies and procedures. Rescue technicians shall complete all activities in the safest possible manner and shall follow national, federal, state, provincial, and local safety standards as they apply to the rescue technician.
- 2-2 Before beginning training activities or engaging in rescue incidents the following requirements shall be complied with:
- (1) Age requirements established by the authority having jurisdiction. (AHJ)
  - (2) Medical requirements established by the AHJ.
  - (3) Minimum physical fitness as required by the AHJ.
  - (4) Emergency medical care performance capabilities for entry-level personnel developed and validated by the AHJ.
  - (5) Minimum educational requirements established by the AHJ.
  - (6) Minimum requirements for hazardous material incident and contact control training for entry-level personnel, validated by the AHJ.
- 2-3 For certification, the rescue technician shall perform all of the job performance requirements in Chapter 3 and all job performance requirements listed in at least one of the specialty areas (Chapters 4-9).

### 3-2 Site Operations

- 3-2.1 Identify the needed support resources, given a specific type of rescue incident, so that a resource cache is managed, scene lighting is adequate for the tasks to be undertaken, environmental concerns are managed, personnel rehabilitation is facilitated, and the support operation facilitates rescue operational objectives.
- (a) **Requisite Knowledge:** Equipment organization and tracking methods, lighting resource type and availability, shelter and thermal control options, and rehab criteria.
- (b) **Requisite Skills:** The ability to track equipment inventory, identify lighting resources and structures for shelter and thermal protection, select rehab areas, and manage personnel rotations.
- 3-2.2 Size up a rescue incident, given background information and applicable reference materials, so that the type of rescue is determined, the number of victims is identified, the last reported location of all victims is established, witnesses are identified and interviewed, resource needs are assessed, search parameters are identified, and information required to develop an incident action plan is obtained.
- (a) **Requisite Knowledge:** Types of reference materials and their uses, availability and capability of the resources, elements of an action plan and related information, relationship of sizeup to the incident management system, and information gathering techniques and how that information is used in the sizeup process.
- (b) **Requisite Skills:** The ability to read technical rescue reference materials, gather information, relay information, and use information gathering sources.
- 3-2.3 Manage incident hazards, given scene control barriers personal protective equipment, 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 and victims are minimized, and rescue time constraints are taken into account.
- (a) **Requisite Knowledge:** Resource capabilities and limitations, types, and nature of incident hazards, equipment types and their use, isolation terminology, methods, equipment and implementation, operational requirement concerns, common types of rescuer and victim risk, risk-benefit analysis methods and practices, and types of technical references.

(b) **Requisite Skills:** The ability to identify resource capabilities and limitations, identify incident hazards, assess victim viability (risk-benefit), utilize technical references, place scene control barriers, and operate control and mitigation equipment.

3-2.4 Management resources in a rescue incident, given incident information, a means of communication, resources, tactical worksheets, personnel accountability protocol, applicable references, and standard operating procedures, so that references are correctly utilized, personnel are accounted for, deployed resources achieve desired objectives, incident actions are documented, rescue efforts are coordinated, the command structure is established, task assignments are clearly communicated and monitored, and actions are consistent with applicable regulations.

(a) **Requisite Knowledge:** Incident management system, tactical worksheet application and purposes, accountability protocols, resource types and deployment methods, documentation methods and requirements, availability, capabilities and limitations of rescuers and other resources, typical communication problems and needs, communications requirements, methods and means, types of tasks and assignment responsibilities, policies and procedures of the agency, and technical references related to the type of rescue incident.

(b) **Requisite Skills:** The ability to implement an incident management system. Complete tactical worksheets, use reference materials, evaluate incident information, match resources to operational needs, operate communications equipment, manage incident communications, and communicate in a clear and concise manner so that objectives are met.

3-2.5 Conduct a search, given hazard-specific personal protective equipment, equipment pertinent to search mission, an incident location, and victim investigative information, so that search parameters are established, victim profile is established, the entry and exit of all people either involved in the search or already within the search area are questioned and the information is updated and relayed to command, the personnel assignments match their expertise, all victims are located as quickly as possible, applicable technical rescue concerns are managed, risks to searchers are minimized, and all searchers are accounted for.

(a) **Requisite Knowledge:** Local policies and procedures and how to operate in the site-specific search environment.

(b) **Requisite Skills:** The ability to enter, maneuver in, and exit the search environment and provide for and perform self-escape/rescue.

3-2.6 Perform ground support and operations for helicopter activities, given a rescue scenario/incident, helicopter, operational plans, personal protective equipment, requisite equipment, and available specialized resources, so that rescue personnel are familiar with operational characteristics of the aircraft and demonstrate operational proficiency in establishing and securing landing zones and communicating with aircraft personnel until the assignment is complete.

(a) **Requisite Knowledge:** Ground support operations relating to helicopter use and deployment, operation plans for helicopter service activities, type-specific personal protective equipment, aircraft familiarization and hazard areas specific to helicopter, scene control and landing zone requirements, aircraft safety systems, and communications protocols.

(b) **Requisite Skills:** The ability to provide ground support operations, review standard operating procedures for helicopter operations, use personal protective equipment, establish and control landing zones, and communicate with aircrews.

3-2.7 Terminate the incident, given isolation barriers and specialized teams and equipment so that all personnel are accounted for and removed from the scene, hazards are eliminated or controlled, further entry is denied, the victim is transported to the appropriate care facility, the scene is rendered safe, rescue personnel are returned to a state of readiness, appropriate reporting and documentation of the incident is completed, and a critique and critical incident stress debriefing is conducted with rescue personnel.

(a) **Requisite Knowledge:** How to secure a scene, forms for documentation, resources for critical incident stress debriefing, and local medical transportation protocol.

(b) **Requisite Skills:** The ability to provide scene security, complete reporting documentation of the incident, and apply local medical transportation protocol.

### 3-3 Victim Management

3-3.1 Access a victim, given tool kits, personal protective equipment, and other equipment designed to allow physical approach to the victim so that hazards are managed, the rescuer can approach the victim, the access point is determined, the means of access is maintained and secured, and an escape route is identified.

- (a) **Requisite Knowledge:** Recognition and methods to manage potential hazards within the rescue environment, methods and means to gain access, use of appropriate personal protective equipment and tool kit(s) used to gain access to the victim, and factors used to identify escape routes.
  - (b) **Requisite Skills:** The ability to manage hazards, use provided tools, use personal protective equipment, and choose safe entry and escape routes and techniques and tools (specific to the rescue environment) to make access to the victim.
- 3-3.2 Assess a victim, given personal protective equipment to include protection for airborne and bloodborne pathogens and a basic first aid kit, so that required resources can be identified and obtained, injuries are identified, risks to rescuers are minimized, victim viability is established, and treatment priorities are established.
- (a) **Requisite Knowledge:** Victim assessment procedures, universal precautions for infectious disease, emergency medical care, considerations related to mechanisms of injuries, issues relating to protocol, and types of resources and availability.
  - (b) **Requisite Skills:** The ability to use personal protective clothing, use personal protective equipment, follow established assessment procedures, relate mechanism of injury to assessment, and evaluate scene hazards.
- 3-3.3 Stabilize the victim, given a basic first aid kit, so that the victim's airway is established and maintained, ventilation is adequate, circulation is maintained, severe bleeding is controlled, spinal immobilization precautions are taken, and the victim is treated for shock.
- (a) **Requisite Knowledge:** Emergency medical care and uses for personal protective equipment.
  - (b) **Requisite Skills:** The ability to initiate emergency medical care and use personal protective equipment.
- 3-3.4 Triage victims, given triage tags and local protocol, so that rescue versus recovery factors are considered, triage decisions reflect resource capabilities, severity of injuries is determined, and victim care and rescue priorities are established in accordance with local protocol.
- (a) **Requisite Knowledge:** Types and systems of triage according to local protocol, resource availability, methods to determine injury severity, ways to manage resource, and prioritization requirements.



- (b) **Requisite Skills:** The ability to use triage materials, techniques, and resources and to categorize victims properly.
  
- 3-3.5 Package an ill or injured victim, given a basic first aid kit and other specialized equipment if available, so that environmental conditions are considered, illnesses or injuries are managed, and the potential for further injury is minimized.

  - (a) **Requisite Knowledge:** Effects of environmental conditions on packaging, emergency medical care, packaging equipment and methods, ways to minimize additional injuries, immobilization techniques, and application of victim personal protective equipment.
  - (b) **Requisite Skills:** The ability to select and apply packaging equipment, protect a victim, immobilize injuries, and apply personal protective equipment to a victim.

- 3-3.6 Move a victim to low-angle environment, given victim transport equipment, litters, other specialized equipment if available, and victim removal systems appropriate to the specific rescue environment, so that the victim is moved without undue further injuries, risks to rescuers are minimized, the integrity of the victim's securement within the transfer device is established and maintained, the means of attachment to the rope rescue system is secure, and the victim is removed from the hazard.

  - (a) **Requisite Knowledge:** Types of transport equipment and removal systems, selection factors with regard to specific rescue environments, methods to reduce and prevent further injuries, types of risks, common to rescuers, ways to establish and maintain victim securement, transport techniques, rope rigging applications and methods, and types of specialized equipment and their uses.
  - (b) **Requisite Skills:** The ability to secure a victim to transport equipment, assemble and operate environment-specific victim removal systems, and choose an incident-specific transport device.

- 3-3.7 Transfer a victim to emergency medical services (EMS) given local medical protocols, so that all pertinent information is passed from rescuer to EMS provider, and the victim can be transported to a medical facility.

  - (a) **Requisite Knowledge:** Medical protocols for victim transfer, uses for checklists, triage tags or report forms utilized for this purpose by the authority having jurisdiction, risks, laws and liabilities related to victim transfer, and information needs of the EMS provider.

- (b) **Requisite Skills:** The ability to report victim conditions and history to the EMS provider and to complete reports and checklists, and verbal communication skills.

### 3-4 Maintenance

- 3-4.1 Inspect and maintain hazard-specific personal protective equipment, given clothing or equipment for the protection of the rescuers, including respiratory protection, cleaning and sanitation supplies, maintenance logs or records, and such tools and resources as are indicated by manufacturer's guidelines for assembly or disassembly of components during repair or maintenance, so that damage, defects, and wear are identified and reported or repaired as needed, equipment functions as designed, and preventive maintenance has been performed and documented consistent with the manufacturer's recommendations.

- (a) **Requisite Knowledge:** Functions, construction, and operation of personal protective equipment; use of record-keeping systems of the authority having jurisdiction; requirements and procedures for cleaning, sanitizing and infectious disease control; use of provided assembly and disassembly tools; manufacturer and agency recommendations; pre-use inspection procedures; and ways to determine operational readiness.

- (b) **Requisite Skills:** The ability to identify wear and damage indicators for personal protective equipment; evaluate operational readiness of personal protective equipment; complete logs and records; use cleaning equipment, supplies, and reference materials; and select and use tools appropriate to the task.

- 3-4.2 Inspect and maintain rescue equipment, given maintenance logs and records, tools and resources as indicated by the manufacturer's guidelines, an equipment replacement protocol, and organizational standard operating procedure, so that the operational status of equipment is verified and documented, all components are checked for operation, deficiencies are repaired or reported as indicated by standard operating procedure, and items subject to replacement protocol are correctly disposed of and changed.

- (a) **Requisite Knowledge:** Functions and operations of rescue equipment, use of record-keeping systems, manufacturer and organizational care and maintenance requirements, selection and use of maintenance tools, replacement protocol and procedures, disposal methods, and organizational standard operating procedures.

(b) **Requisite Skills:** The ability to identify wear and damage indicators for rescue equipment, evaluate operation readiness of equipment, complete logs and records, and select and use maintenance tools.

### 3-5 Ropes/Rigging

3-5.1 Tie knots, bends, and hitches, given ropes and webbing, so that the knots are properly dressed, recognizable, and safetied as required.

(a) **Requisite Knowledge:** Knot efficiency, proper knot utilization, rope construction, rope terminology, and methods of safety.

(b) **Requisite Skills:** Tie representative knots, bends, or hitches for the following purposes:

- 1) End of the line loop
- 2) Midline loop
- 3) Securing rope around desired objects
- 4) Joining rope or webbing ends together
- 5) Gripping rope

3-5.2 Construct a single-point anchor system, given life safety rope, edge protection, and other auxiliary rope rescue equipment if available, so that the chosen anchor system fits the incident needs, meets or exceeds the expected load, and does not interfere with rescue operations, the critical angle is not exceeded, a safe and efficient anchor point is chosen, the need for redundant anchor points is assessed and used as required, the anchor system is inspected and loaded prior to being placed into service, and the integrity of the system is maintained throughout the operation.

(a) **Requisite Knowledge:** Application of knots, safe rigging principles, anchor selection criteria, system safety check procedures, rope construction, and rope rescue equipment applications and limitations.

(b) **Requisite Skills:** The ability to select rope and equipment; tie knots; rig systems; evaluate anchor points for desired strength, location, and surface contour; and perform a system safety check.

3-5.3 Construct a simple rope mechanical advantage system, given life safety rope, carabiners, pulleys, rope grab devices, and auxiliary rope rescue equipment if available, so that the system constructed can accommodate the load, is efficient, and is connected to an anchor system and the load.

- (a) **Requisite Knowledge:** Principles of mechanical advantage, capabilities and limitations of various simple rope mechanical advantage systems, applications of knots, safe rigging principles, and system safety check procedures.
  - (b) **Requisite Skills:** The ability to select rope and equipment, tie knots, choose and rig systems, attach the mechanical advantage system to the anchor system and load, and perform a system safety check.
- 3-5.4 Direct a team in the operation of a simple rope mechanical advantage system, given rescue personnel, and established rope rescue system incorporating a simple rope mechanical advantage system, a load to be removed, and an anchor system, so that the movement is controlled, the load can be held in place when needed, operating methods do not stress the system to the point of failure, appropriate commands are used to direct the operation, and potential problems are readily identified, communicated, and managed.
- (a) **Requisite Knowledge:** Principles of mechanical advantage, capabilities and limitations of various simple rope mechanical advantage systems, proper operation of simple rope mechanical advantage systems, personnel assignments, and operational commands.
  - (b) **Requisite Skills:** Direct personnel effectively, use operational commands, analyze system efficiency, identify safety concerns, and perform system safety check.
- 3-5.5 Construct a lowering system, given an anchor system, life safety rope(s), descent control device, and auxiliary rope rescue equipment if available, so that the system can accommodate the load, is efficient, is capable of holding the load in place or lowering with minimal effort over the desired distance, and is connected to an anchor system and the load.
- (a) **Requisite Knowledge:** Capabilities and limitations of various descent control devices, capabilities and limitations of various lowering systems, applications of knots, safe rigging principles, and system safety check procedures.
  - (b) **Requisite Skills:** The ability to tie knots, perform rigging, properly attach to descent control device, anchor system, and load, and perform a system safety check.
- 3-5.6 Direct a lowering operation, given appropriate rescue personnel, an established lowering system, and a load to be moved, so that the movement is controlled, the load can be held in place when needed, operating methods do not stress the system to the point of failure, rope commands are used to direct the operations, and potential problems are readily identified, communicated, and managed.

(a) **Requisite Knowledge:** Applications and use of descent control devices, capabilities and limitations of various lowering systems, proper operation of lowering systems, personnel assignments, and operational commands.

(b) **Requisite Skills:** The ability to direct personnel effectively, use operational commands, analyze system efficiency, manage movement of the load, identify safety concerns, and perform a system safety check.

3-5.7 Construct a belay system, given life safety rope, anchor systems, personal protective equipment, and auxiliary rope rescue equipment if available, so that the system is capable of arresting a fall, a fall will not result in system failure, the system is not loaded unless actuated, actuation of the system will not injure or render the belayer ineffective, the belayer is not rigged into the equipment components of the system, and the system is suitable to the site and is connected to an anchor system and the load.

(a) **Requisite Knowledge:** Principles of belay systems, capabilities and limitations of various belay devices, application of knots, safe rigging principles, and system safety check procedures.

(b) **Requisite Skills:** The ability to select a system, tie knots, perform rigging, attach to anchor system and load, don and use task-specific personal protective equipment, and perform a system safety check.

3-5.8 Operate a belay system during a lowering or raising operation, given an operating lowering or hauling system, a belay system, and a load, so that the belay line is not loaded during operation of the primary rope rescue system, the belay system, and a load, so that the belay line is not loaded during operation of the primary rope rescue system, the belay system is prepared for actuation at all times during the operation, the belayer is attentive at all times during the operation, the load's position is continually monitored, and the belayer moves rope through the belay device as designed.

(a) **Requisite Knowledge:** Application and use of belay devices, proper operation of belay systems in conjunction with normal lowering and hauling operations, and operational commands.

(b) **Requisite Skills:** The ability to tend a belay system as designed, tie approved knots, assess system effectiveness, properly attach a belay line to a belay device, don and use task-specific personal protective equipment, perform a system safety check, and manage and communicate belay system status effectively.

3-5.9 Belay a falling load, given a belay system and a dropped load, so that the belay line is not taut until the load is falling, the belay device is actuated when the load falls, the fall is arrested, the belayer utilizes the belay system as designed, and the belayer is not injured or rendered ineffective during actuation of the belay system.

(a) **Requisite Knowledge:** Application and use of belay devices, effective emergency operation of belay devices to arrest falls, personal protective equipment, and operating procedures.

(b) **Requisite Skills:** The ability to operate a belay system as designed, tie approved knots, use task-specific personal protective equipment, recognize and rapidly react to a falling load, and communicate belay system actuation.

3-5.10 Conduct a system safety check, given a rope rescue system and rescue personnel, so that a physical/visual check of the system is made to ensure proper rigging, a load test is performed prior to life-loading the system, and verbal confirmation of these actions is announced and acknowledged before life-loading the rope rescue system.

(a) **Requisite Knowledge:** System safety check procedures, construction and operation of rope rescue systems and their individual components, proper personal protective equipment, equipment inspection criteria, signs of equipment damage, principles of safe rigging, and equipment replacement criteria.

(b) **Requisite Skills:** The ability to apply and use personal protective equipment, inspect rope rescue system components for damage, assess a rope rescue system for improper configuration, secure equipment components, inspect all rigging, and perform a system safety check.

## 9 Trench Rescue

9-1.1 Conduct a size-up of a collapses trench, given an incident and background information and applicable reference material, so that the size-up is conducted within the scope of the incident management system; the existing and potential conditions are evaluated within the trench and the rescue area; general hazards are identified; a witness or "competent person" is secured; the probability of victim existence, number, condition, and location is determined; potential for rapid, nonentry rescues or victim self rescue is recognized; needed personnel, supply, and equipment resources are evaluated; and utility involvement and location is determined.

(a) **Requisite Knowledge:** Methods to distinguish soil types, collapse mechanics, and other contributing factors such as severe environmental conditions and other general hazards, need to immediately secure "competent person" or witness; signs and evidence of victim involvement, number, and location; jurisdictional and community resource lists and agreement, effects and hazards of collapse and rescue efforts on utilities at the incident site; Personnel training level and availability; risk-benefit analysis; protocols, incident management system; and all applicable regulations, laws, and standards.



(b) **Requisite Skills:** The ability to measure dimensions of trench, categorize soil, identify type and degree of collapse, and determine severe environmental conditions with implications for secondary collapse and victim survivability; demonstrate interview techniques, implement protocols and resource acquisition agreements, implement public works utility notification, response, and location procedures; perform a risk-benefit analysis for determining self-rescue, rescue, or recovery mode; implement an incident management system for span of control; and apply governing regulations, laws, and standards.



9-1.2 Implement a trench emergency action plan, given size-up information and a trench incident, so that initial size-up information is utilized; prebriefing is given to rescuers; documentation is ongoing; the collapse zone is established; a risk-benefit analysis is conducted; rapid, nonentry rescues or victim(s) self rescues are performed; the rescue area and general area is made safe; strategy and tactics are confirmed and initiated for existing and potential conditions; rapid intervention team and operational tasks are assigned; other hazards are mitigated; rescue resources are staged; and a protective system is being utilized.



(a) **Requisite Knowledge:** Size-up information and documentation; need to brief rescuers; areas that could be affected by collapse; variables to factor risk-benefit analysis; criteria for rapid, nonentry rescues; methods to control hazards in the general area; options for strategy and tactical approach by factoring time frame, risk-benefit, approved shoring techniques, and personnel and equipment available; incident management system; rescue personnel and equipment cache staging; and options for victim isolation and/or protective systems.



(b) **Requisite Skills:** The ability to use and document tactical worksheets; disseminate information; understand mechanics and extent of collapse effects; perform risk-benefit analysis; execute rapid, nonentry rescues; mitigate hazards by isolation, removal, or control; choose strategy and tactics that will enhance successful outcome; use incident management systems and resource staging; and apply choice of isolation and/or protective system promptly to surround victim.

9-1.3 Implement support operations at trench emergencies, given an assignment and available resources, so that a resource cache is managed, scene lighting is adequate for the tasks to be undertaken, environmental concerns are managed, a cut station is established, supplemental power is provided for all equipment, atmospheric monitoring and ventilation are implemented, personal rehab is facilitated, operations proceed without interruptions, extrication methods are in place, and the support operations facilitate rescue operational objectives.

(a) **Requisite Knowledge:** Equipment organization and tracking methods, lighting resources type and availability, de-watering methods, shelter and thermal control options, basic carpentry methods, hand and power tool applications, atmospheric monitoring protocol, rehab criteria, and extrication and removal equipment options.

(b) **Requisite Skills:** The ability to track equipment inventory, provide power, apply efficient use of lighting resources, choose and deploy dewatering techniques, acquire or construct structures for shelter and thermal protection, select rehab areas and personnel rotations, operate atmospheric monitoring and ventilation equipment, and perform patient packaging and removal.

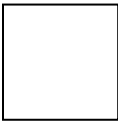
9-1.4 Construct load stabilization systems, given an assignment, personal protective equipment, and a trench tool kit, so that the stabilization system will support the load safely, the system is stable, and the assignment is completed.

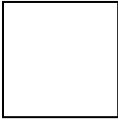
(a) **Requisite Knowledge:** Different types of stabilization systems and their construction methods, limitations of the system, load calculations, principles of and applications for stabilization systems, and safety considerations.

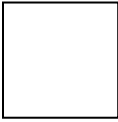
(b) **Requisite Skills:** The ability to select and construct stabilization systems, evaluate structural integrity of the system, determine stability, and calculate loads.

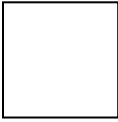


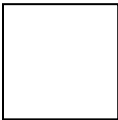
- 9-1.5 Lift a heavy load as a team member, given a trench tool kit, so that the load is lifted the required distance to gain access, settling or dropping of the load is prevented, control and stabilization are maintained before, during, and after the lift, and operational objectives are attained.
- (a) **Requisite Knowledge:** Applications of levers, classes of levers, principles of leverage, gravity and load balance, resistance force, mechanics and types of load stabilization, mechanics of load lifting, application of pneumatic, hydraulic, mechanical, and manual lifting tools, how to calculate the weight of the load, and safety zones and considerations.
- (b) **Requisite Skills:** The ability to evaluate and estimate the weight of the load, the proper operations of the tools, the proper operation of a lever, and proper application of load stabilization systems.
- 9-1.6 Coordinate the use of heavy equipment, given personal protective equipment, means of communication, equipment and operator, and an assignment, so that operator suitability for task is considered, common communications are maintained, equipment usage supports the operational objectives, hazards are avoided, and life safety is maintained.
- (a) **Requisite Knowledge:** Types of heavy equipment, capabilities, application and hazards of heavy equipment and rigging, operator training and safety considerations, types of communication, and methods to establish common communication.
- (b) **Requisite Skills:** The ability to use hand signals, use radio equipment, recognize hazards, assess operator for skill and calm demeanor, assess heavy equipment for precision of movement and maintenance, monitor rescuer and victim safety, and use personal protective equipment.
- 9-1.7 Support a nonintersecting trench as a member of a team, given size-up information, 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 soil pile are monitored continuously, rescue entry team(s) remain in a safe zone, and slough-in and wall shears are mitigated, emergency procedures and warning system are established and understood by participating personnel, incident-specific personal protective equipment is utilized, physical hazards are identified and managed, victim and rescuer protection is maximized, victim extrication methods are considered, and a rapid intervention team is staged.

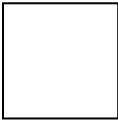
(a) **Requisite Knowledge:** Shoring and shielding, tabulated data, strategies and tactics, protocols on making the general area safe, criteria for a safe zone within the trench, types of collapses and techniques to stabilize, emergency procedures, selection of personal protective equipment, consideration of selected stabilization tactics on extrication, and victim safety. 

(b) **Requisite Skills:** The ability to interpret tabulated data information and tables, place shoring and shielding systems, use protocols, choose methods to stabilize, use personal protective equipment, anticipate extrication logistics, and create systems in trenches 8 ft. (2.438m) deep. 

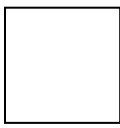
9-1.8 Support an intersecting trench as a member of a team, given size-up information and action plan, a trench tool kit, and an assignment, so that strategies to minimize the further movement of soil are implemented effectively, trench walls, lip and soil pile are monitored continuously, rescue entry team(s) in the trench remain 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. 

(a) **Requisite Knowledge:** Shoring and shielding, tabulated data, strategies and tactics, types of intersecting trenches and techniques to stabilize, protocols on making the general area safe, criteria for safe zones in the trench, types of collapses and techniques to stabilize, emergency procedures, selection of personal protective equipment, and consideration of selected stabilization tactics on extrication and victim safety. 

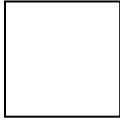
(b) **Requisite Skills:** The ability to interpret tabulated data information and tables, place shoring and shielding systems, identify type of intersecting trench, use trench rescue protocols, select types of collapse and methods to stabilize, identify hazards in a trench, use personal protective equipment, and anticipate extrication logistics. 

9-1.9 Install supplemental sheeting and shoring for each 2 ft. (0.61m) 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. 

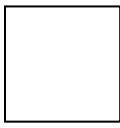
(a) **Requisite Knowledge:** Shoring and shielding, tabulated data, strategies and tactics, methods and techniques to install supplemental sheeting and shoring, protocols on making the general area safe, criteria for safe zones in the trench, types of collapses and techniques to stabilize, emergency procedures, selection of personal protective equipment, consideration of selected stabilization tactics on extrication, and victim safety.



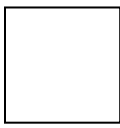
(b) **Requisite Skills:** The ability to interpret tabulated data information and tables, place shoring and shielding systems, identify supplemental sheeting and shoring, use all trench rescue protocols, select types of collapse and methods to stabilize, identify exposure to hazards within the trench relative to existing safe zones, select and use personal protective equipment, and anticipate extrication logistics.



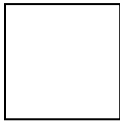
9-1.10 Release a victim from entrapment by components of a collapsed trench, given personal protective equipment, a trench rescue tool kit, and specialized equipment, so that hazard to rescue personnel and victims are minimized, considerations are given to crush syndrome and other injuries, techniques are used to enhance patient survivability, tasks are accomplished within projected time frame, and techniques do not compromise the integrity of the existing trench shoring system.



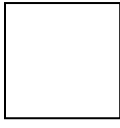
(a) **Requisite Knowledge:** Identification, utilization and proper care of personal protective equipment, general hazards associated with each type of trench collapse; methods of evaluating shoring systems and trench wall stability; crush syndrome protocols, identification of collapse characteristics; causes and associated effects of trench collapse; potential signs of subsequent collapse; selection and application of rescue tools and resources; risk-benefit assessment techniques for extrication methods; and time restraints.



(b) **Requisite Skills:** The ability to select use, and care for personal protective equipment, operate rescue tools and stabilization systems, identify crush syndrome clinical settings, and complete risk-benefit assessments for selected methods of rescue and time restraints.



9-1.11 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 crush syndrome, methods and packaging devices selected are compatible with intended routes of transfer, universal precautions are employed to protect personnel from bloodborne pathogens, and extraction times meet time constraints for medical management.



(a) **Requisite Knowledge:** Medical protocols, available medical resources, transfer methods and time needed to rescue, universal precautions protocol, rope rescue systems, highpoint anchor options, and patient ladder raise removal techniques.

(b) **Requisite Skills:** The ability to select and use personal protective equipment, provide basic medical care and immobilization techniques, identify the need for advanced life support and crush syndrome management, and use a removal system that matches logistical and medical management timeframe concerns.

9-1.12 Terminate a trench emergency incident, given personal protective equipment and removal of victim(s), so that 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, the last supporting shores are pulled free with ropes, equipment is cleaned and serviced, reports are completed, and a post briefing is performed.

(a) **Requisite Knowledge:** Selection of personal protective equipment, equipment used and locations, shoring and shielding tactics and order of placement, shoring removal protocols, criteria for "safe zone" within the trench, personnel accountability, emergency procedures, manufacturer's recommended care and maintenance procedures, and briefing protocols.

(b) **Requisite Skills:** The ability to use personal protective equipment, remove equipment and protective systems, use trench safety protocols, clean and service equipment, and perform a post incident brief.