



**ARCADIA FIRE DEPARTMENT
STANDARD OPERATING GUIDELINE**

ROPE RESCUE

Number: 138
Revision Date: 08/12/2012
File Name: Rope Rescue

Review Date: 03/25/2017

Approved: _____
Michael E. Lang, Fire Chief

PURPOSE

The purpose of this procedure is to establish guidelines for conducting rope rescues, training, maintenance of rope and related equipment. Because of the number of potential sites and situations that could be encountered, this procedure will not define a specific evolution to use, but will give guidelines to follow for conducting safe and effective operations.

DEFINITION

Rope rescue is defined as any rescue attempt that requires rope and related equipment to safely gain access to, and remove victims from, hazardous geographic areas with limited access such as mountains, high rise buildings, above or below grade structures, by means of rope system. Rope rescues are divided into two general categories; non-technical and technical.

Non-technical evacuations are those of less than 40 degree inclination. Technical evacuations are considered those from 40 degrees to 90 degrees. Technical evacuations may require the assistance of US&R trained personnel.

TACTICAL CONSIDERATIONS

- I. PHASE I – Initial Actions
 - a. Assume Command.
 - b. Secure Responsible Party or Witness.
 - c. Locate the Victim
 - d. Assess the Need for Additional Resources. Number of victims, location and condition of victims, estimated angle of terrain, distance to victim, and estimated time of extraction.
 - e. Assign a Safety Officer
 - f. Develop an Action Plan.

- II. PHASE II - Rescue Operations
 - a. Implement the Action Plan. Rescue operations should be conducted with from low risk to high risk. Rescues should be conducted with the least amount of risk to rescuers necessary to rescue the victim. Low risk operations are not always possible but should be considered first.
 - b. The order of rescue from low risk to high risk would be:
 1. Talk the victim into self-rescue.

2. For terrain less than 40 degree inclination, (non-technical) most first responders have the equipment and training to assist the victim down. If the victim is ambulatory, he/she can walk down with the assistance of rescuers. If the victim is injured or unable to assist in their own rescue, he/she shall be packaged properly in a stokes basket and carried to safety.

PHASE II - Rescue Operations- continued

3. The stokes extrication should be conducted with a minimum of 4 litter bearers. Bearers should face the direction of travel during the extrication. If appropriate, a tag line should be attached to the litter for assistance through unstable areas.
4. For terrain of greater than 40 degree inclination and the victim is ambulatory, he/she may be assisted down by rescuers with the use of a belay/tag line. If appropriate, rescuers should set up an anchor system for the belay.

If the victim is not ambulatory, rescuers shall build an anchor system and prepare for a steep angle evacuation. The victim shall be packaged properly in a litter and prepared for the extrication. There shall be at least 3 litter attendants assisting with the litter evacuation. Attendants should face the anchor during the evacuation and be clipped into the litter. A separate raising/lowering line and belay line shall be set up for raising or lowering during steep angle evacuations.

5. Evacuations greater than 60 degrees are considered high angle operations. This may include putting the victim(s) in a harness and raising or lowering them, or packaging them in a litter for the raising and/or lowering.
6. In any case, a 10:1 safety factor shall be maintained and a double rope technique shall be used if at all possible. If possible, a separate anchor should be used for the working line and the belay line.
7. Helicopter operations are considered high risk operations. Several factors must be considered before deciding on the use of a helo for extrications. Some of these factors are: time of day, condition of victim, difficult access to the victim.

III. PHASE III - Termination

- a. Personnel Accountability.
- b. Consider debriefing
- c. Secure the scene. Return to service.
- d. Additional Considerations
 1. HEAT. Consider rotation of crews.
 2. COLD. Consider effects of hypothermia on victim and rescuers.
 3. RAIN. Consider the effects of rain on the hazard profile.
 4. TIME OF DAY. Is there sufficient lighting for operations extending into the night.
 5. Consider the effect on family and friends; keep family informed.
 6. Consider news media; assign a P.I.O.

ROPE RESCUE EQUIPMENT - Specifications, Care and Maintenance

ROPE

Uses

Rappel line, lowering line, safety belay, litter tag line, or in mechanical advantage pulley systems. It is not intended to be used as a tow rope, utility line, etc. This is to be considered a life safety line only. The rescuer's life as well as the victim's may depend on it.

Construction

Nylon, low-stretch / static kernmantle

Have an inner core and an outer sheath

Outer sheath protects core

75%-85% of the ropes strength comes from the core, depending on manufacturer

Specifications

Diameter: 1/2" (12.7mm)

Strength: 9,000 pounds (loses approximately 15% when wet)

Lengths: 150' for most companies; up to 300' lengths

Maintenance

Inspect, visually after each use, for damage to sheath, dirt or mildew, and feel for soft spots in rope core, by "running" or pulling the rope between thumb and index finger.

Wash when dirty.

Immediately remove damaged rope from service

Core

Wash with mild nonchlorine-based detergent and water. Hang loosely and allow to air dry out of direct sunlight. Once rope is dry, it is stuffed, not coiled, in rope bag and stored in a dry, dust-free place, where not exposed to chemical (petroleum, alkalis') and direct sunlight.

Precautions

1. NEVER step or stand on the rope.
2. Don't drop rope from great heights when it can be carried down.
3. Don't drag rope across ground or apparatus bays.
4. Provide edge protection.
5. Avoid nylon passing on nylon; i.e., rope passing over itself, another rope or webbing.
6. Keep all rope and webbing material out of petroleum and alkaline products, and if forced to use in applications where contamination will occur (around wheels, axles, etc.), remove from service.

WEBBING

Uses.

Anchor slings, gear slings, harness, and lashing.

Construction.

Nylon, tubular.

Specifications.

One inch wide; Strength of 4,000 pounds.

Maintenance.

Same as rope.

Care.

Same as rope.

Precautions.

Same as rope.

ACCESSORY CORD

Uses

Loops of 8 mm accessory cord can be attached to a host rope by a prusik hitch to form attachment points for pulleys.

Construction.

Nylon, low stretch / static kernmantle.

Specifications.

Accessory cord diameter may vary from 6 mm to 9 mm, depending on application.

Maintenance.

Same as rope.

Care.

Same as rope.

Precautions.

Same as rope.

CARABINEERS

Uses.

To link various pieces of gear together, or to add friction to a system.

Construction.

Locking, steel, pin type or key lock, not lock sleeve dependent. Locking, aluminum, pin type or key lock, not lock sleeve dependent.

Specifications.

Steel: 40 kN breaking strength. Aluminum: 30 kN to 40 kN breaking strength.

Precautions.

1. Keep clean.
2. Don't drop or throw.
3. Load only in the long axis, no side loading.
4. Don't forget to lock the gate.
5. Inspect for cracks, worn spots, and smooth operation.

PULLEYS

Uses

Reduce friction.

Change direction.

To gain mechanical advantage.

Construction

Sealed ball bearing, anodized aluminum sides.

Specifications

2" and 4" size. 36 kN minimum breaking strength.

Precautions

1. Keep clean.
2. Don't drop or throw.
3. Inspect for smooth operation, elongated holes.

GENERAL PRECAUTIONS

1. Make sure all knots are tied and dressed correctly.
2. Maintain a 10:1 safety margin
3. Rescuers shall not approach an edge without being tied in
4. Rescuers shall wear appropriate PPE.