

# KINNELON VOLUNTEER FIRE CO, INC.

## ROPE RESCUE TRAINING COURSE

### PERSONAL EQUIPMENT AND PROTECTION

#### **TERMS**

Emergency Seat Harness – A temporary, tied harness to be used when a manufactured, sewn seat harness is not available.

Fully Body Harness – A type of harness that offers both pelvic and upper body support as one unit.

Helmet – Head covering that protects against head injury both from falling objects and from head impact.

#### **HELMET**

Designed not only for protection from falling objects, but also to reduce the severity of brain injury should the wearer happen to fall and hit his head. That is why only helmet designed for high angle work should be worn. A chin strap should be used to help keep the helmet on your head. The helmet should also have what is called a "three-point suspension" system. This means that there is support on both sides and a rear support which helps keep the helmet from falling over your eyes. The brim is usually narrow to keep the rope from knocking it off your head.

#### **CLOTHING**

Should be made of materials that will protect you from adverse environmental conditions and provide comfort. Do to the fact that a rope rescue may take some time to complete, you may want to be dressed for a long stay during inclement weather, to protect yourself from the chilling effects of rain or cold. An outerwear "shell" made of waterproof material such as nylon can help protect against both perception and the cooling effects of wind. One draw back of nylon is that with intense physical activity, the lack of air circulation under the shell may make you sweat, making the inside as wet as the outside. Polypropylene or Goretex™ may be a solution to this problem.

#### **FOOTWEAR**

Leather is one of the good multi-purpose boots that are recommended for high angle work. Boots should have good ankle support and protect feet from scraps, cuts, and bruises. To help maintain balance against surfaces found in high angle rescue environments, soles should have good adhesion.

#### **GLOVES**

Should be worn to protect hands from the weather and against burns and abrasions from a running rope. Should be made from soft leather, such as deerskin or goat skin. The heavy fire fighter gloves are often too thick to feel the rope and tie the knots.

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#### ***FULL BODY HARNESS***

High angle harnesses are constructed of nylon or polyester webbing that wraps the pelvic region to support it and attaches the rescuer to the rope. Webbing should be at least two inches wide for comfort at the waist and thighs. Should be easy to put on and adjust. Should not slip down when you walk. Should not allow you to fall out when you hang upside down. Have front tie-in points to maintain a correct center of gravity whatever the activity you are performing. Have a metal attachment point usually a large "D" ring where the carabiners are clipped directly into.



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### ROPE AND WEBBING

#### **ROPE FIBERS**

Polyolefins™ – Polypropylene and Polyethylene

Kevlar™ – Dupont™ trade name for a type of Aramid™ fiber

Polyester – Sometimes know as Dacron™

Nylon – Two most commonly used are Nylon 6 (also known as “Perlon™”) and Nylon 6,6.

#### **ROPE CONSTRUCTION**

Laid – Consists of twisting small fiber bundles of material and then combining them in larger bundles, which are twisted around one another, usually in groups of three.

Double Braid – A solid braid covered with a hollow braid combined into one construction.

Kermantle – Consists of a central core (kern) of fibers which supports the major portion of the load on the rope. This core is covered by a woven sheath (mantle) that supports a lesser portion of the load.

Static Kermantle – A type of rope with very low stretch. Because of very little stretch this rope provides a more sudden stop when catching a fall.

#### **SAFETY FACTOR OF ROPE**

The first thing you need to do is to estimate what the maximum load you expect to be on the rope. Then take this number and using a safety factor of 15:1 calculate the minimum breaking strength. Example: if you have a rescuer, with equipment and you add a rescue subject and a litter with assorted gear, the total might near 600 pounds. The total breaking strength should be 9,000 pounds.  $600 \times 15 = 9,000$

#### **WEBBING**

Most webbing is made of nylon or polyester materials that have the same characteristics as those used to manufacture rope. Use the same procedure for determining the safety factor of rope.

Construction – **Flat webbing** is constructed of a single layer of material the same as belt webbing. It is stiffer and more difficult to work with than tubular webbing.

**Tubular webbing** is more supple and easier to work with and is more often used in rope rescue work. There are two different types of tubular webbing:

Edge Stitched - Formed by folding over flat webbing lengthwise and stitching the two edges together.

Spiral Weave – Is constructed by weaving a tube as a unit. Traditionally more common in rope rescue operations.