Summit Anchor Company, Inc.®

Safety From The Top Down

Horizontal Cable Systems

Suspended Access Systems and Fall Protection

Overview

Horizontal cable systems are generally installed as a permanent fall protection system, typically consisting of two terminating roof anchors connected by a galvanized steel or stainless steel wire rope. Summit Anchor Co. offers horizontal cable systems for three common applications:

- **Horizontal Fall Restraint Cable System:**
  Restrains workers from reaching a roof edge, preventing them from reaching a position from which they could fall down off an elevated surface.
- **Horizontal Fall Arrest Cable System:**
  Arrests a fall (generally, wherever possible, a fall restraint system is preferred over fall arrest system).
- **Horizontal Anchorage Cable for Rope Descent System:**
  Provides anchorage in difficult areas of a complete building rope descent system package.

Due to the potential for misuse of horizontal cables in day-to-day field operations, portable cables would never be used for fall protection. Workers shall only use permanent horizontal cable systems that have been specifically designed by a Professional Engineer with a background in such applications.

Horizontal Fall Restraint Cable System

The ANSI/IWCA I-14.1 Window Cleaning Safety Standard requires fall protection when a maintenance worker must travel within 6 feet of a vertical drop greater than 6 feet. Fall protection may be in the form of a code-compliant guardrail or parapet. When such code-compliant perimeter guarding does not exist and cannot be installed, another form of fall protection should be provided. A horizontal fall restraint cable system may fill this need.

This horizontal cable system is designed to restrain workers from reaching a roof edge, thereby preventing them from falling off an elevated surface. Summit Anchor Company's horizontal fall restraint cable system can be configured to safely allow up to two workers continuous horizontal movement across spans of up to 100 feet. Intermediate cable restraint anchors must be evenly spaced along large spans, every 30 feet maximum, to reduce the load to terminating anchors and minimize cable sag.

Hook must have locking gate to support 5,000 lbs.

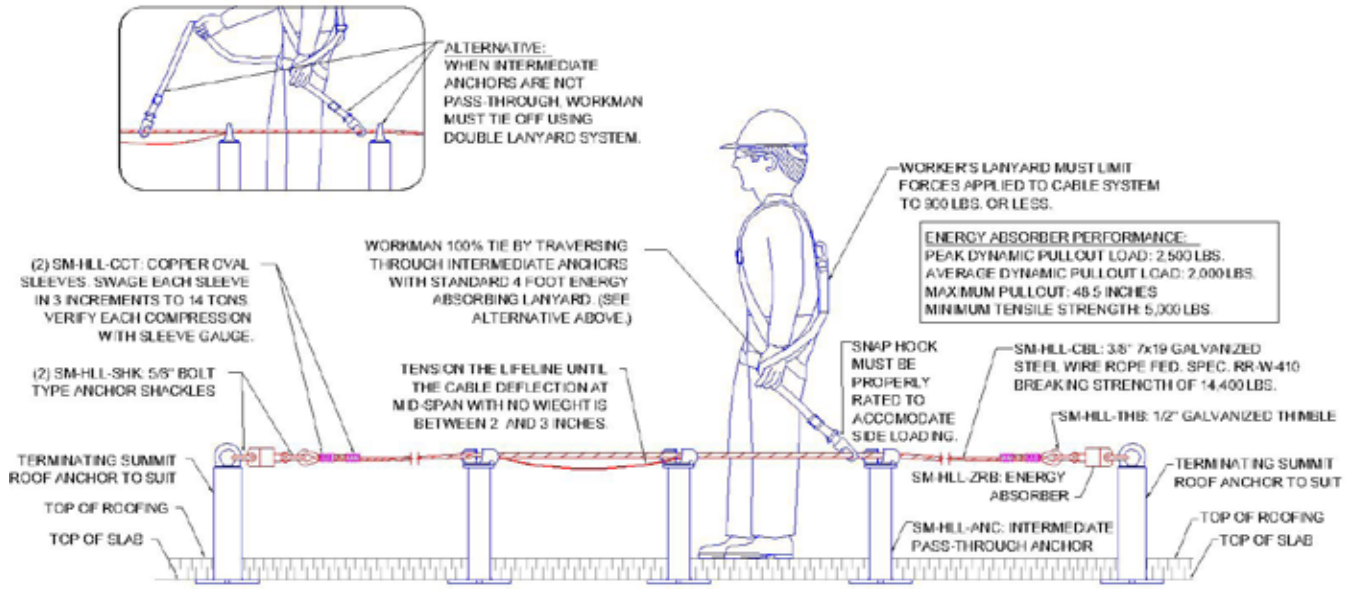
Easy to Use Features:

- Simple passage of a lanyard hook through intermediate brackets without trolleys
- Attach and detach at any safe location along the cable

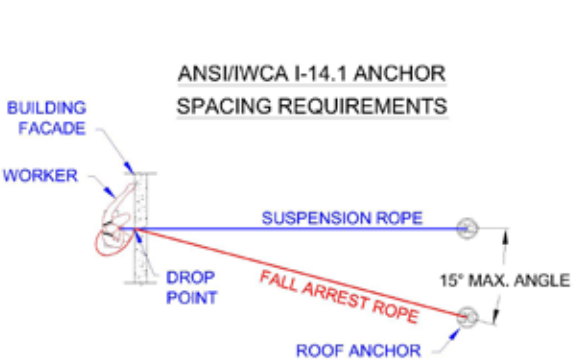
Design Considerations:

- Design the system with a lanyard to restrict workers from a fall. For example, the lanyard must limit the workers' travel to no farther than a safe distance to the back of the parapet or leading edge.
- Design the system with one energy absorber for spans up to 60 feet.
- Design the system with two energy absorbers for spans up to 100 feet.
- Terminating anchors should be designed to support a minimum 5,000 lb ultimate load capacity and as required to withstand the loads imposed by the horizontal line.

Horizontal Fall Restraint Cable System
Summit Model #SM-HLL



Horizontal Anchorage Cables for Rope Descent System



The ANSI/IWCA I-14.1 Window Cleaning Safety Standard specifies that the maximum angle between a worker's suspension rope and fall arrest rope shall not exceed 15 degrees during rope descent, as shown in the figure below:

In areas of a building where anchorages cannot be placed so that the angle between independent ropes meets this requirement, a horizontal cable system can be designed to be used as anchorage. However, a horizontal anchorage cable system generally does not reduce the amount of anchors required.

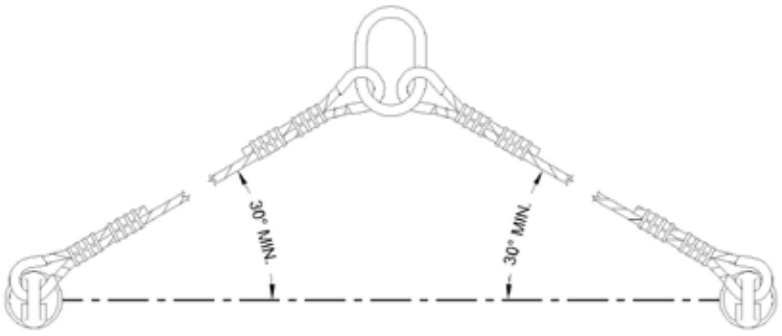
Layout Requirements:

- Horizontal anchorage cables must be installed in pairs so that a worker can attach a suspension rope to one cable and a fall arrest rope (lifeline) to another cable.
- One cable shall never be used to simultaneously secure a worker's suspension rope and fall arrest rope.
- The anchors between which each cable spans may be placed no more than 30 feet apart.
- Horizontal anchorage cables shall have a minimum of 30° of slag from horizontal.
- Horizontal anchorage cable systems need to be engineered to withstand any amplified loads that may be imposed to anchorages by cable angles less than 30°. The angle is measured between the horizontal plane between the two anchors and the horizontal cable legs (see illustration below).
- Positioning attachments should be permanently installed on cables at pre-determined locations to prevent the worker's rigging from sliding along the cable.

This area of the structure did not have enough supports to allow anchors to be spaced close enough to meet ANSI/IWCA I-14.1 spacing requirements. A horizontal anchorage cable system was used to allow rope descents in this location. Four roof anchors and two cables are used. One worker will attach a suspension rope to one cable and a fall arrest rope to the other cable before making a rope descent.

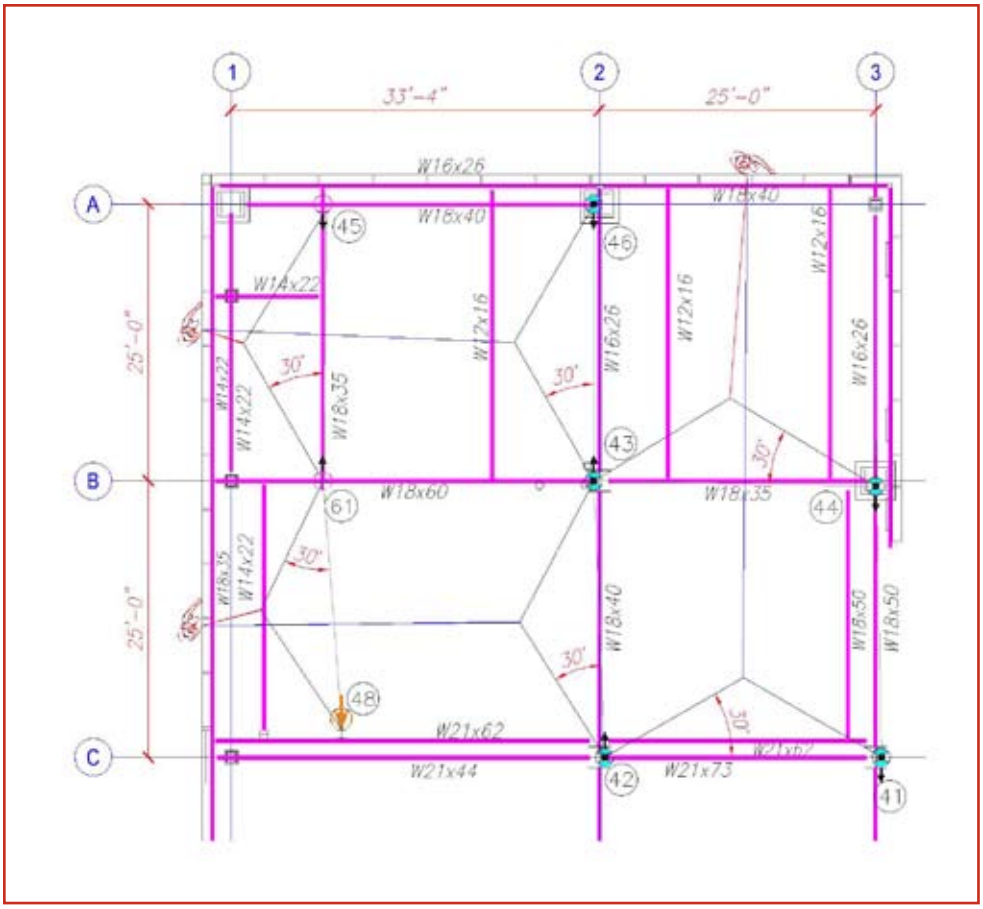
Positioning Attachment:
A positioning attachment is a tie-off point at a pre-determined location that prevents a worker's rigging from sliding along the cable. Each tie-off point should be located to maintain a 30° cable angle (see illustration).

SUGGESTED ANGLES FOR HORIZONTAL ANCHORAGE CABLE SYSTEM



NOTES:
1. THE HORIZONTAL SLING ANGLE IS MEASURED BETWEEN THE HORIZONTAL LINE BETWEEN ANCHORAGES AND THE EITHER CABLE LEG.
2. "AS THE SLING ANGLE APPROACHES 30 DEGREES, THE LOAD MULTIPLIER INCREASES SIGNIFICANTLY. AT SMALLER ANGLES, THE MULTIPLIER INCREASES EVEN MORE DRAMATICALLY."
3. THE SLING ANGLE SHALL NEVER BE ALLOWED TO BE LESS THAN 30 DEGREES.

Terminating anchors should be designed to support a minimum 5,000 lb. ultimate load capacity and as required to withstand the loads imposed by the horizontal anchorage cable.



A sample layout for horizontal anchorage cables for a rope descent system.

Because a total of four anchors are required for each descent, this system is generally not economical. Using a horizontal anchorage cable system as an anchorage is more restrictive than direct rigging to anchors. Therefore, horizontal anchorage cables for rope descent systems should only be used when unique building features do not allow a worker to tie a suspension rope and a fall arrest rope to independent anchorages and maintain the required 15 degree angle.

Design Assistance

Summit Anchor Co. offers design assistance to give you an idea of what may be required to accommodate your project's suspended maintenance needs. We will review your project's needs, and based on our expert experience, we will offer suggestions for the correct type of equipment needed and the general locations where these should be installed.

Please provide us with the following information in the form of AutoCAD drawing files:

- Architectural and structural floor plans of any level where equipment is required
- Building elevations
- Section drawings of parapet walls, penthouse walls, other rooftop obstructions, and roof levels
- Any other drawings that will be useful in understanding your project's needs

Contact Summit Anchor Co. today at 1.800.372.1098.