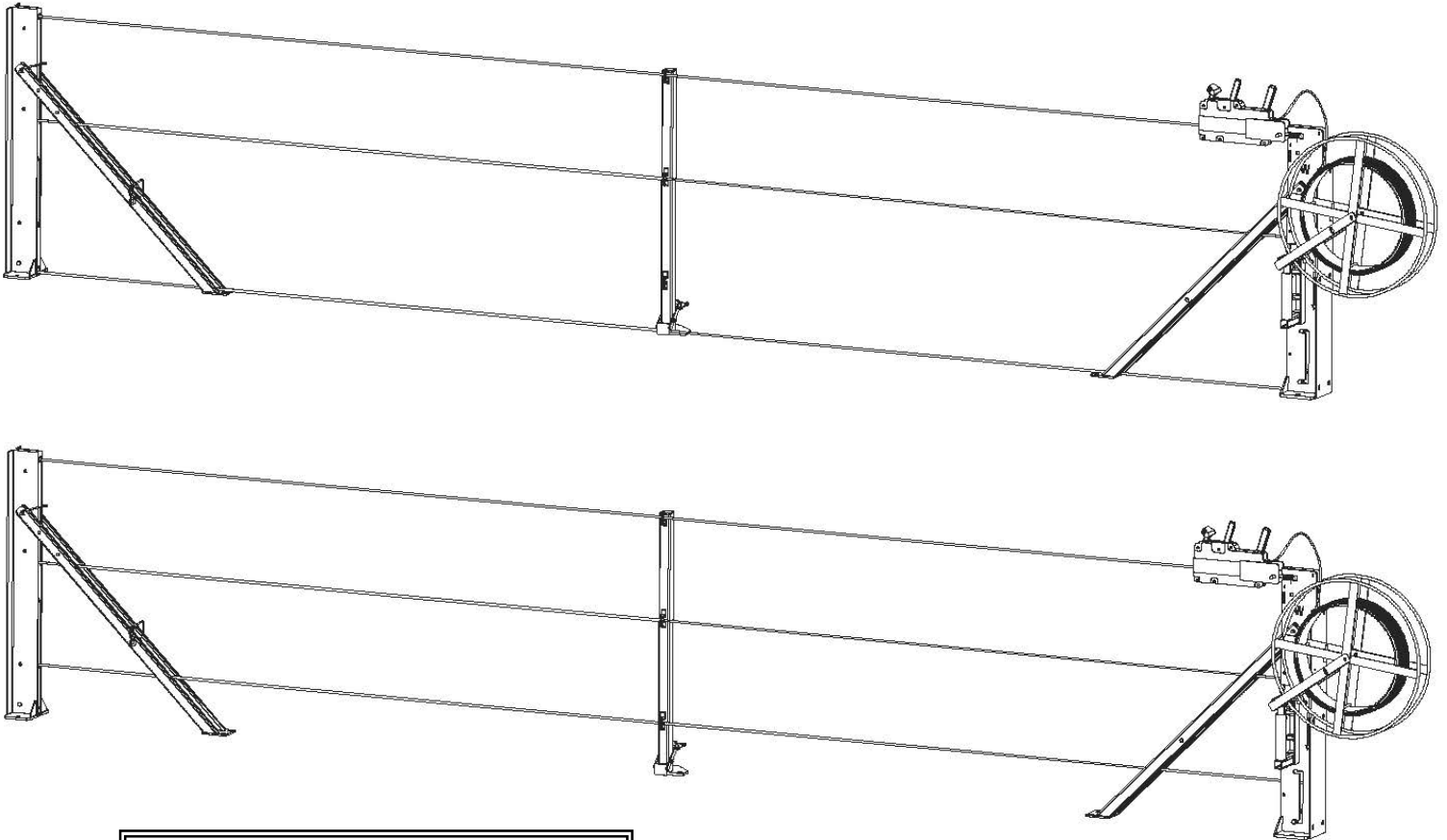


RopeRail[®] Made by Superchute[®]



IMPORTANT REFERENCE DOCUMENT

45" Tall Guardrail - Installation Manual

1-800-363-2488

www.superchute.com

www.roperail.com

U.S. Patent Pending
CAN Patent Pending
U.S. Trademark 4467972
CAN Trademark TMA847615

Edition of August 22, 2016

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IMPORTANT NOTICE:

IT IS THE RESPONSIBILITY OF COMPANIES THAT SELL, RENT OR USE THE ROPERAIL SYSTEM TO FREELY SUPPLY THE LATEST EDITION OF THIS MANUAL TO THE FOLLOWING PERSONS:

- THE PLANNERS AND SUPERVISORS OF THE SYSTEM
- THE INSTALLERS OF THE SYSTEM
- THE USERS OF THE SYSTEM

Use the Most Recent Edition:

- This edition of the RopeRail Installation Manual contains important new information.
- The information within is current and supersedes information in previous editions.
- Discard older editions of the RopeRail Installation Manual.
- If at any time you are unsure of how to proceed, call Superchute Ltd. toll free 1-800-363-2488.

If you have any questions or comments concerning this manual, please feel free to contact Superchute Ltd.

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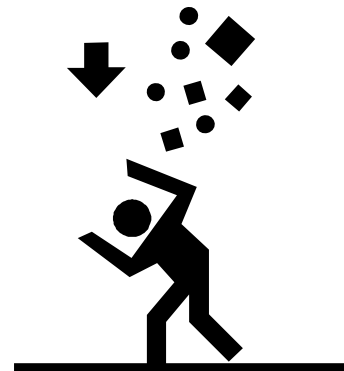
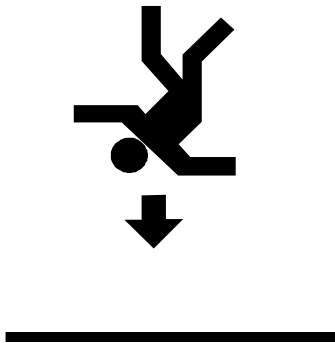
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Warnings



WARNING



- The installation, dismantle, and use of a Guardrail System involves many hazards. For example, the risk of:
 - Workers falling off a building.
 - Falling materials or debris striking persons below.
- Planners, Supervisors, Installers, and Users must read, understand, and follow the instructions found in this manual before rigging or adjusting the RopeRail® System.
- Failure to follow the instructions in this manual may result in serious injury or death.
- If you need help, please call the Superchute Factory toll free: 1-800-363-2488
- For extra copies of the manual simply call Superchute, or download the manual at www.superchute.com or www.roperail.com



WARNING

- A person can easily fall to a lower level if unprotected sides, edges, and openings are present.
- A fall from a height of 6 ft. (1.8 meters) is enough to cause serious injury or death.
- Use a personal fall arrest system (for example: a body harness, lanyard, and anchorages) when working near a floor edge that does not have proper fall protection.
- OSHA requires that fall protection barriers be at least 42" high, plus or minus 3" (107 cm, plus or minus 8 cm). Guardrail systems, parapet walls, and window sills may be acceptable fall protection barriers provided they meet OSHA's height and strength criteria.
- Read and understand the OSHA fall protection regulations (a few of the regulations are provided on the next two pages).

Regulations

The RopeRail System is designed to meet OSHA Regulations (Standards – 29 CFR)
Part 1926 Safety and Health Regulations for Construction
Subpart M - Fall Protection
1926.502

OSHA Extracts Concerning Worker Fall Protection

1926.502(b)(1)

TOP RAILS “Top edge height of top rails ... shall be 42 inches (1.1 m) plus or minus 3 inches (8 cm) above the walking/working level.”

1926.502(b)(2)

MIDRAILS “Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working surface when there is no wall or parapet wall at least 21 inches (53 cm) high.”

1926.502(b)(2)(iv)

OPENINGS “Other structural members (such as additional midrails and architectural panels) shall be installed such that there are no openings in the guardrail system that are more than 19 inches (.5 m) wide.”

1926.502(b)(9)

WIRE ROPE Top rails and midrails shall be at least one-quarter inch (0.6 cm) nominal diameter or thickness to prevent cuts and lacerations. If wire rope is used for top rails, it shall be flagged at not more than 6-foot intervals with high-visibility material.

OSHA Extracts Concerning Falling Object Protection

1926.502(j)(2)

TOEBOARDS “Toeboards shall be a minimum of 3.5” (9 cm) in vertical height from their top edge to the level of the walking/working surface. They shall have not more than ¼” (0.6 cm) clearance above the walking/working surface.”

1926.502(j)(5)

OPENINGS “Guardrail systems, when used as falling object protection, shall have all openings small enough to prevent passage of potential falling objects.”

A Few More OSHA Regulations We Would Like To Draw Your Attention To

“The employer shall determine if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.”

“Each employee on a walking/working surface ... with an unprotected side or edge which is 6 ft (1.8 meters) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.”

“An unprotected side or edge means any side or edge ... where there is no wall or guardrail system at least 39” (1 meter) high.”

“Each employee in a hoist area shall be protected from falling 6 feet (1.8 meters) or more to lower levels by guardrail systems or personal fall arrest systems. If guardrail systems ... or portions thereof, are removed to facilitate the hoisting operation ... and an employee must lean through the access opening or out over the edge of the access opening (to receive or guide equipment and materials, for example) that employee shall be protected from fall hazards by a personal fall arrest system.”

For a more complete understanding of OSHA’s Regulations consult OSHA’s excellent online documentation on the internet at www.osha.gov.

Some states have their own regulations, which will differ from the U.S. Dept. of Labor’s OSHA regulations.

Introduction

RopeRail is a portable 45” tall guardrail system, designed for temporary use on construction & industrial work sites.

In addition to providing worker fall protection, RopeRail is overlaid with high visibility netting which provides falling object protection. The netting is required to ensure that the guardrail is visible to workers.

A single length of wire rope is threaded between the 2 anchor posts, and tensioned using a cam winch. Additional stiffening posts are used at 20 foot intervals. The netting completes the system.

The posts can be bolted to the slab floor, bolted to concrete walls, or strapped to structural columns. If strapped to structural columns, the installation does not require the use of any tools or penetrating fasteners.

Installation requires 2 competent workers, with prior training in fall protection. Training in the use of the system by Superchute Factory trainers is recommended. To install or dismantle, allow approx. 1 hour per system.

Rail Member Heights

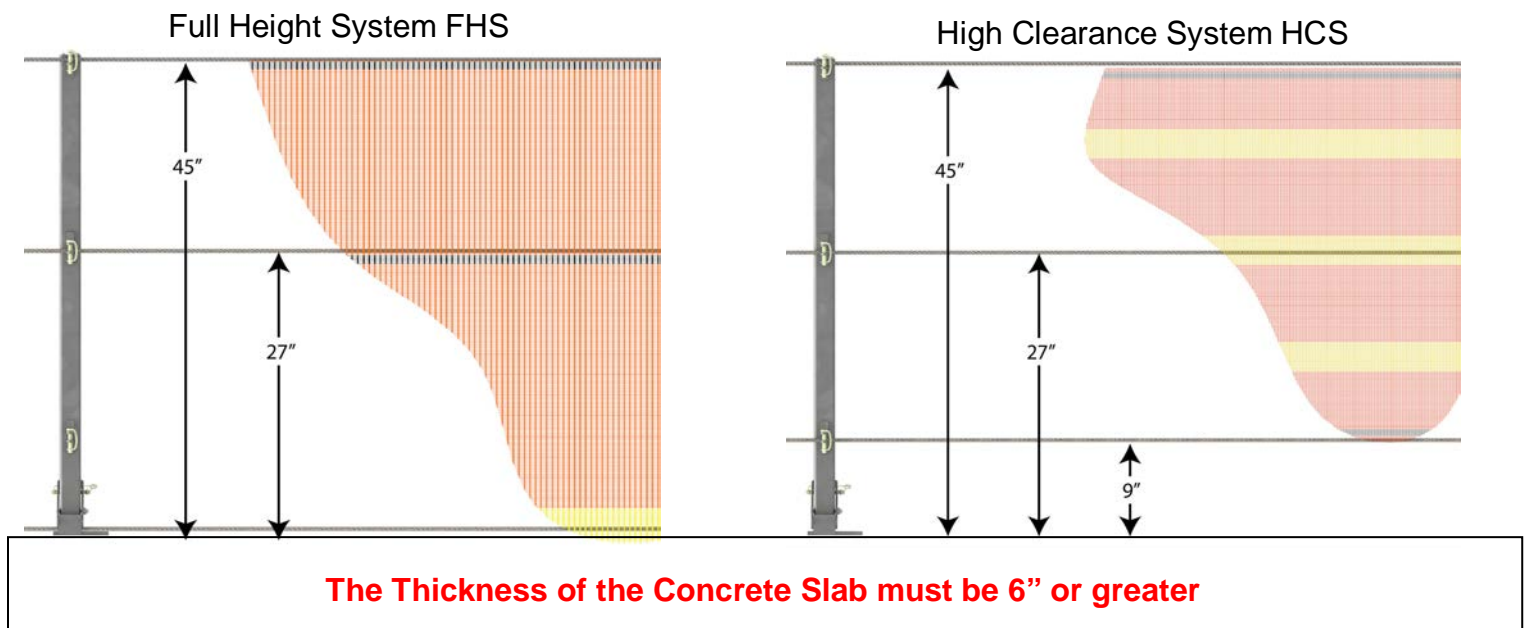
In any railing system, Top Rail, Midrail, and Toeboard members must be maintained at specific heights to comply with OSHA guardrail regulations.

The RopeRail system is designed to maintain the wire at the following OSHA compliant heights, and to prevent deflection of the Top Rail below 39”.

The debris netting is not optional. It must be installed in order for RopeRail to comply with OSHA 1926.502.

There are 2 different debris nets available, which allow RopeRail to be used in the following 2 configurations:

- Full Height System (with toeboard equivalent)
- High Clearance System (without any toeboard)



1. Anchor Posts

The RopeRail system relies upon 2 end posts: W (Winch Post) and T (Terminator Post).

1.1 Winch Post “W”

Winch Post:

- Fasten to a solid concrete floor slab or wall slab
- Minimum slab thickness: 6”
- Use 4 approved anchor bolts for floor mounting
- Use 6 approved anchor bolts for wall mounting



Galvanized Steel Post with 2 integrated pulleys

Winch Post with Belt Bar Option:

- Strap post to an existing structural column using the 2 supplied RopeRail webbing belts.



Winch Post with Belt Bar & 2 Belts

1.2 Terminator Post “T”

Terminator Post:

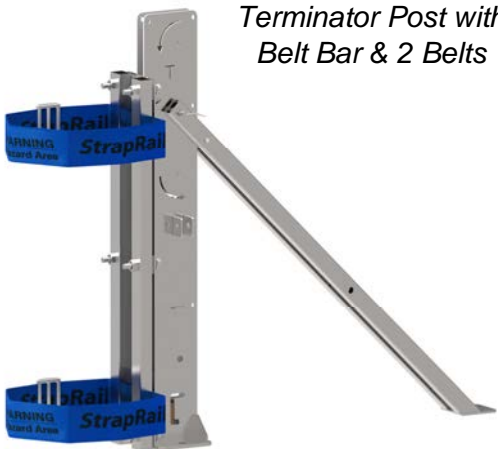
- Fasten to a solid concrete floor slab or wall slab
- Minimum slab thickness: 6”
- Use 4 approved anchor bolts for floor mounting
- Use 6 approved anchor bolts for wall mounting



Galvanized Steel Post with 3 integrated pulleys

Terminator Post with Belt Bar Option:

- Strap post to an existing structural column using the 2 supplied RopeRail webbing belts.



Terminator Post with Belt Bar & 2 Belts

2. Guide Posts

Choice of 2 guide posts. Use these intermediate posts to guide the wire rope along its path, prevent inboard or outboard movement, and maintain the correct height for the wire rope.

Guide Posts must be installed at 20 foot intervals (closer interval spacing is acceptable).

Bolt Down Post:

- Fasten the post to a solid concrete slab.
- Requires 2 approved anchor bolts.

Galvanized Steel



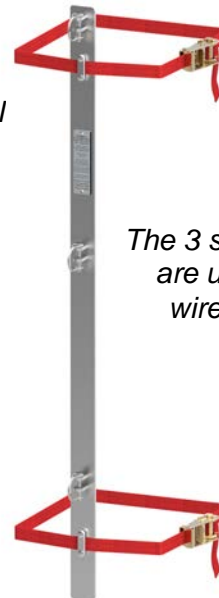
The 3 supplied locking pins are used to secure the wire rope to the post

Integrated base clamp is used to clamp the wire rope to the slab surface

Column Post:

- Strap the post to an existing column using the 2 captive webbing straps and ratchets

Stainless Steel

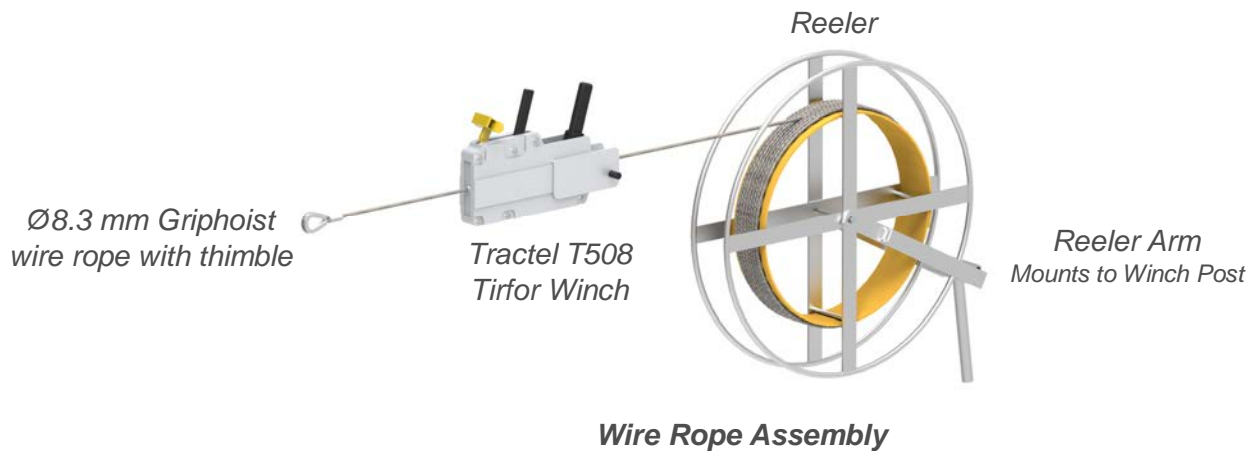


The 3 supplied locking pins are used to secure the wire rope to the post

3. RopeRail Wire Rope Assembly and Accessories

3.1 Wire Rope Assembly

RopeRail wire assembly includes, winch and wire that is wound on Reel.



RopeRail uses a special Ø8.3 mm Tractel Griphoist wire rope with a swaged thimble eye at one end and a fused tapered tip at the other.

This is the only recommended wire for T508 winch as it is able to resist the grinding action of the winch cams. Warning! Do not use off the shelf Ø5/16" wire as it may slip in the winch.

The Rope System is infinitely expandable as long as guide posts are installed every 20-feet.

RopeRail kits are available for purchase with the corresponding length of wire rope that is required:

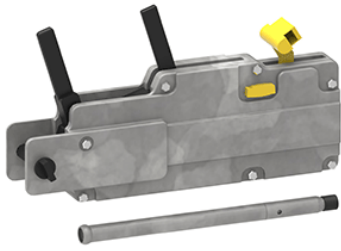
- 100 ft span = 350 ft of 8.3mm Wire
- 150 ft span = 500 ft of 8.3mm Wire
- 200 ft span = 650 ft of 8.3mm Wire
- 225 ft span = 700 ft of 8.3mm Wire
- 250 ft span = 800 ft of 8.3mm Wire

3.2 Winch and Cover

A single Tractel® T508 Tirfor® Winch is used to tension the wire rope to 2000 lb, per the indicator.

This is the only recommended winch for tensioning the wire rope on the RopeRail System.

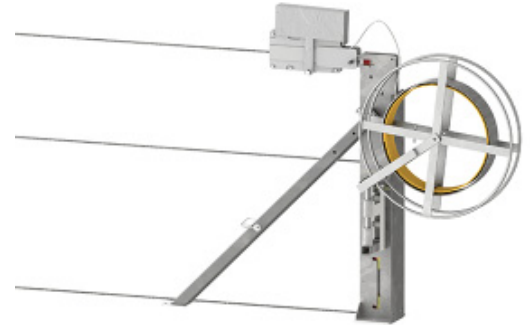
A Lockout Winch cover is supplied to prevent tampering and unauthorized adjustment of the wire rope tension.



Tractel® T508 Tirfor® Winch and Handle



Winch cover and padlock



Winch Post Assembled

3.3 Debris Netting

The debris netting is not optional – it must be installed in order for RopeRail® to comply with OSHA 1926.502.

Debris netting is available in 100' rolls for Full Height System (FHS) as well as High Clearance System (HCS).

Toeboard Net:

- Use if the wire path is set to Full Height mode.
- Provides protection from top wire to floor slab.
- Double ply.
- Secure the 2 plies to the Top Rail wire using the supplied zip-ties.



94" wide orange net with 6" solid yellow band for toeboard equivalence

Heavy duty polyethylene construction

High Clearance Net:

- Use if wire path is set for High Clearance mode.
- Provides protection from the top wire to bottom wire.
- Single ply.
- Secure each edge to Top Rail Wire and Bottom Wire using the supplied zip-ties.

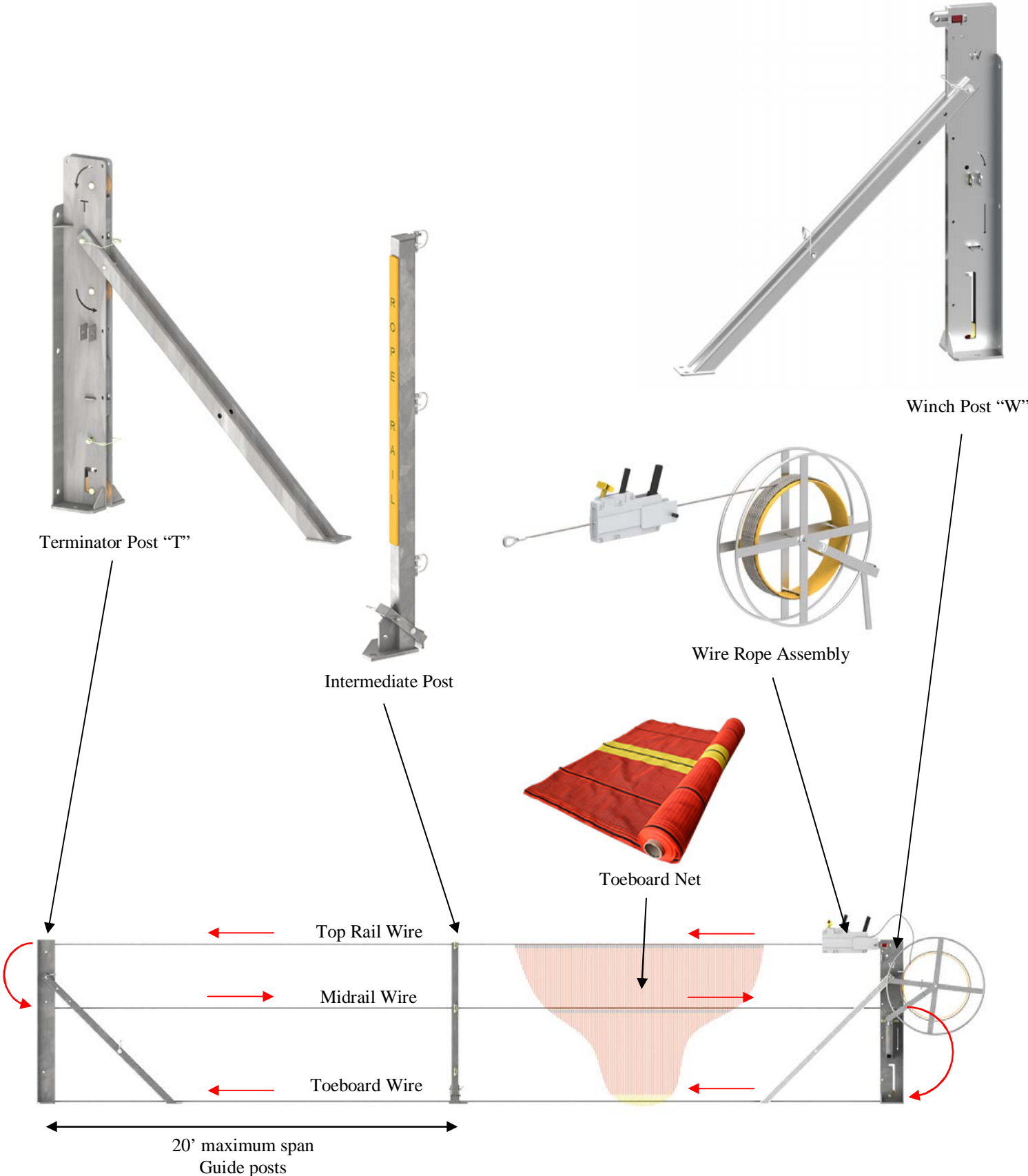


39" wide orange net with 3 yellow stripes

Heavy duty polyethylene construction

Typical Installation on Slab Deck

(See Appendix A for other possible layouts)



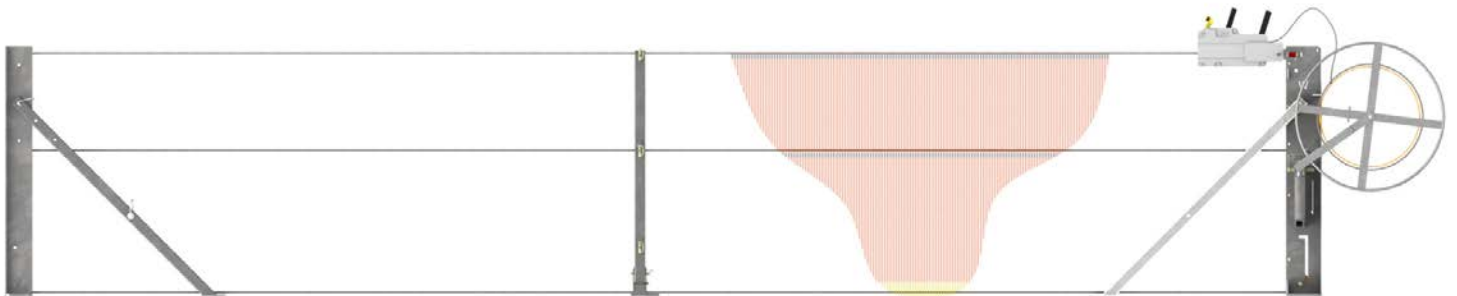
Acceptable Installation Layouts

45" Tall Guardrail With Debris Netting

Worker Fall Protection: Meets OSHA – Netting is Not Optional
 Falling Object Protection: Excellent

Consists of a **Top Rail Wire**, a **Midrail Wire**, and a **Toeboard Wire** all overlaid with **RopeRail 2 Ply Toeboard Nets**.

Netting is installed as a folded 2 ply net tied together at the 45" Top Rail wire with zip ties. The double ply net saves installation time, as it is only tied to a single wire.

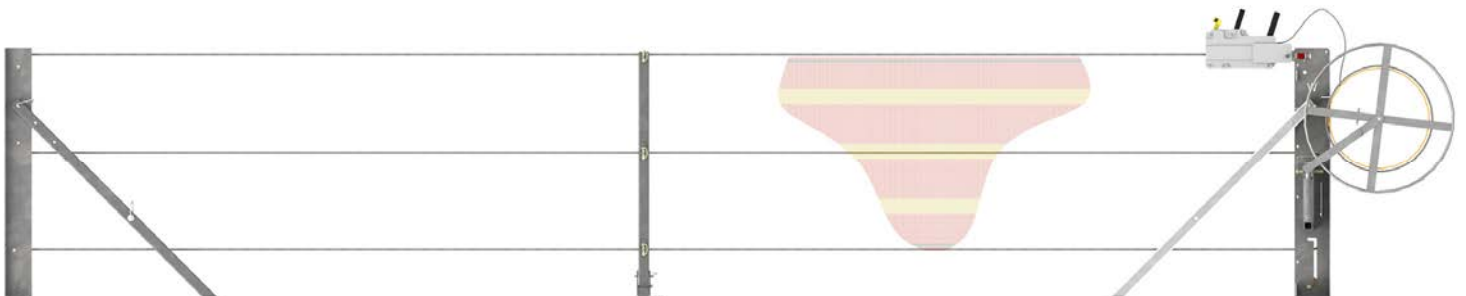


45" Tall High Clearance Guardrail with Debris Netting

Worker Fall Protection: Meets OSHA - Netting is Not Optional
 Falling Object Protection: None

Consists of a **Top Rail Wire** and **Midrail Wire**. The **Toeboard Wire** is raised 9 inches from the ground. All overlaid with **RopeRail 1 Ply High Clearance Net**.

This configuration does **NOT** provide falling object protection. The Toeboard wire is raised off the ground to provide access to the floor slab.



Selection & Installation of the Anchor Posts

- Before you proceed with the installation, a structural engineer must approve the adequacy of the supporting structure.
- Ask the Superchute Factory to prepare a site specific Guardrail Plan for your project. There is usually no charge for this service.
- RopeRail may only be installed by personnel who have been trained and authorized as competent installers by Superchute's Training Staff. A written dispensation can be obtained in certain cases. Contact the factory to confirm the installer's status, or for any other assistance: 1-800-363-2488
- Failure to install the guardrail system properly can result in serious injury or death
- Built in spring loaded indicator for winch will indicate if wire rope is at an appropriate tension. Tension the wire until the indicator washer on the spring reaches the center of the notch.
- Determine where you will start and finish the system.
- Decide which type of anchor post you wish to use at either end of the system:
 - If you plan to bolt down all posts, then you will need a Winch Post, a Terminator Post, and several Bolt Down Guide Posts. These will all have to be bolted down to a properly cured concrete floor slab or wall slab (6" thick minimum).
 - If existing columns are available to you, then consider installing Column Guide Posts, so as to reduce the amount of drilling required.
 - If bolting the anchor posts to a floor slab or wall slab is not possible, then consider using the Winch and Terminator Posts with Belt Bars, along with Column Guide Posts.

For the purposes of this manual, the next few steps will show the most basic system, one that is anchored to existing structural columns.

- Keep in mind that the maximum distance between any 2 fixed posts must not exceed 20 ft. (a fixed post is any anchor post or guide post that has been bolted to the slab, or secured to a column.
- The use of additional fixed posts in a system serves to further stiffen the system, and should be done so whenever possible.
- There are several factory approved anchor bolts. Ask Superchute for assistance in selecting the best bolt for your project. Superchute can also supply the bolts.

Installation of RopeRail Using Bolt-Down Posts

Installation of Bolt-Down Anchor Posts

STEP 1:

- Determine which anchor bolt you will use to secure the post.
- Using a Ferro detector, locate any rebar or embedded tensioning cables in the concrete slab that might hinder drilling through the concrete.
- Place the post (Winch or Terminator) in the desired location. A template is provided to assist in locating the post 4" from the slab edge. With a thick marker, mark off the location of the holes, (or drill right through the template).
- The winch post and terminator post each require 4 or 6 bolts, if installed on slab or wall respectively.



Template for a Winch or Terminator Post
on concrete floor slab



Template for a Winch or Terminator Post
against a concrete wall or column

STEP 2:

- Move the template so as to expose the markings.
- Use a HILTI Hammer Drill or similar, to drill the holes to the required diameter and depth.
- Use a vacuum cleaner to suck the concrete dust out of the drilled holes. An air pump is the least preferred way to evacuate the dust, because it makes the dust airborne and inhalable which is a health hazard.
- HILTI does manufacture a vacuum system that connects directly to a suction drill bit.

STEP 3:

- Place the post over the drilled holes and secure using the anchor bolts.
- Once all the posts are securely installed, continue to the **Installation of Winch & Reeler**.



Winch Post Bolted into Slab using HILTI Bolts

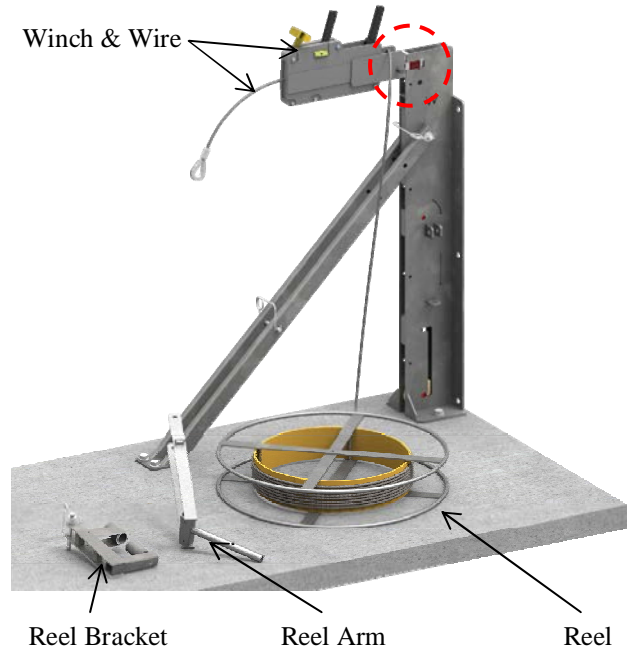


Terminator Post Bolted into Slab using HILTI Bolts

Installation of Winch & Reel

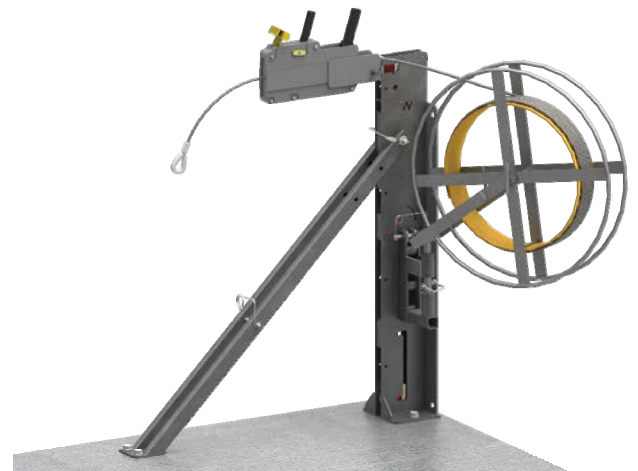
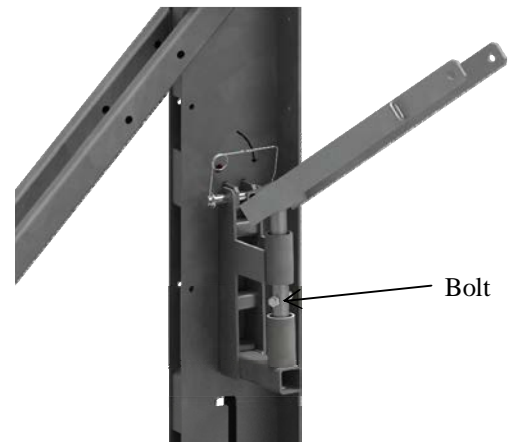
STEP 1:

- Identify all the parts necessary to install winch and reel.
- Temporarily stabilize or secure the reel to make sure it cannot roll away, or roll over the edge.
- Pin the T508 winch to the spring indicator using the winch's captive pin.



STEP 2:

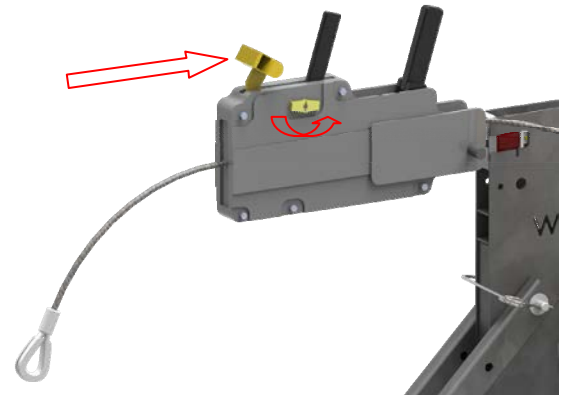
- Pin the reel bracket to the tabs located on the side of the winch post.
- Insert reel arm into the reel bracket.
- Fasten the bolt (as shown) to the stem of the reel arm to prevent it from disengaging from the reel bracket.



Installation of Wire on Bolt-Down Posts

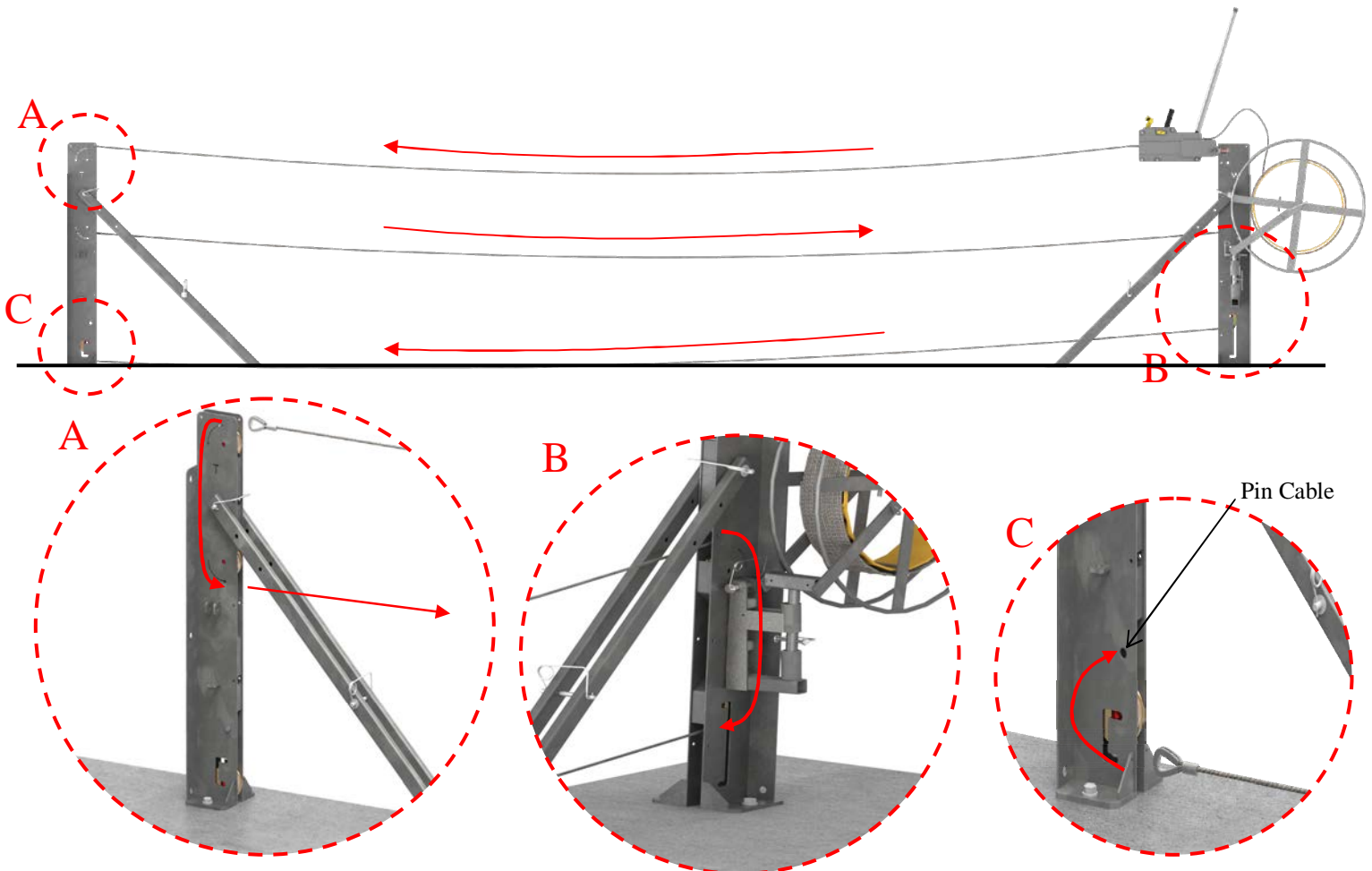
STEP 1:

- For the purposes of this manual, bolt-down posts are used in the following diagrams and the Full Height System is installed.
- Release the wire rope on the T-508 winch by turning the yellow side tabs and pushing back hard on the yellow T handle.



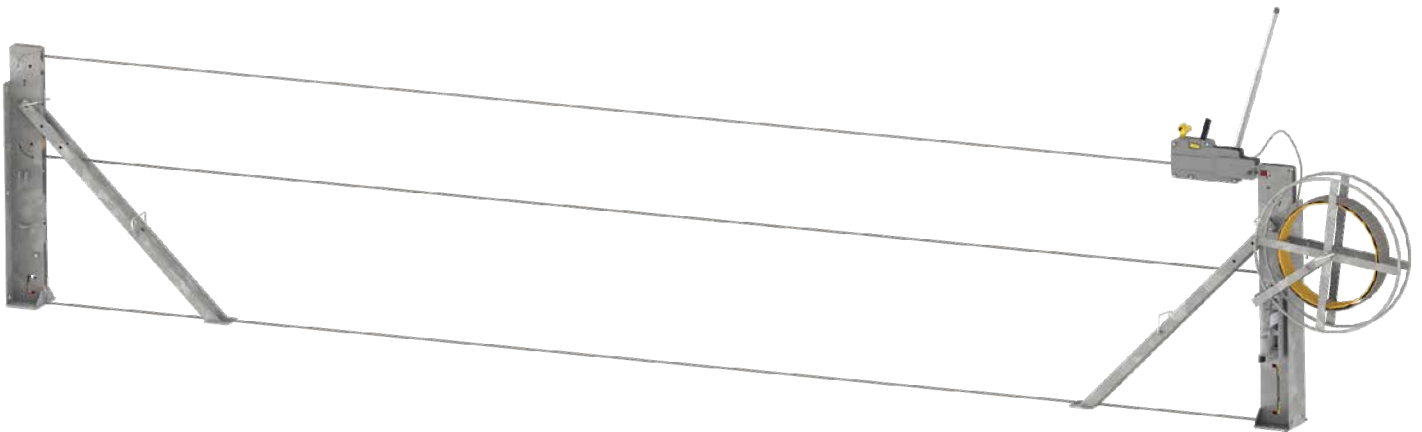
STEP 2:

- Feed the wire rope through the pulleys on the Winch and Terminator Post as to form 3 wire rails: Toprail, Midrail and Toerail.
- The bottom pulleys on both posts will have to be raised to their respective high clearance position to feed the wire rope through.
- Pin the thimble on the end of the wire to the Terminator Post at the 9" high pin position.



STEP 3:

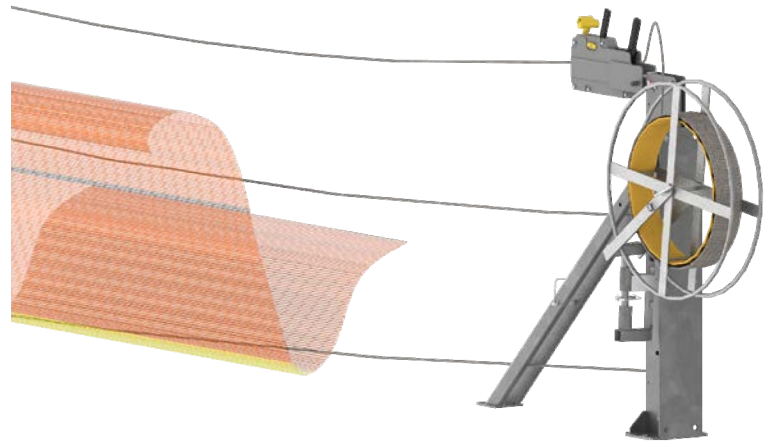
- Reposition the bottom pulleys on the Winch and Terminator Posts down to their respective Full Height System positions.
- Grip the wire rope on the T508 winch by turning the yellow side and pushing forward on the yellow T handle.
- Tension the wire until nearly taut.
- **DO NOT FULLY TENSION WIRE UNTIL DEBRIS NETTING IS COMPLETELY INSTALLED.**



Installation of Toeboard Debris Net (not optional)

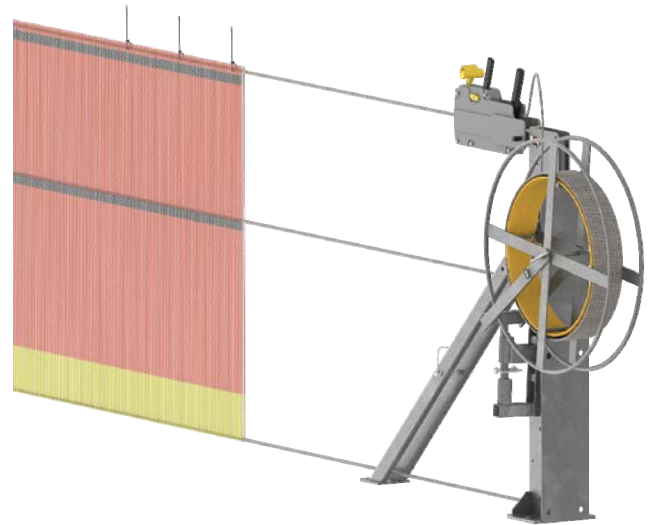
STEP 1:

- Unroll the toeboard net
- Cut the net to the required length
- Feed the beneath the lower wire.



STEP 2:

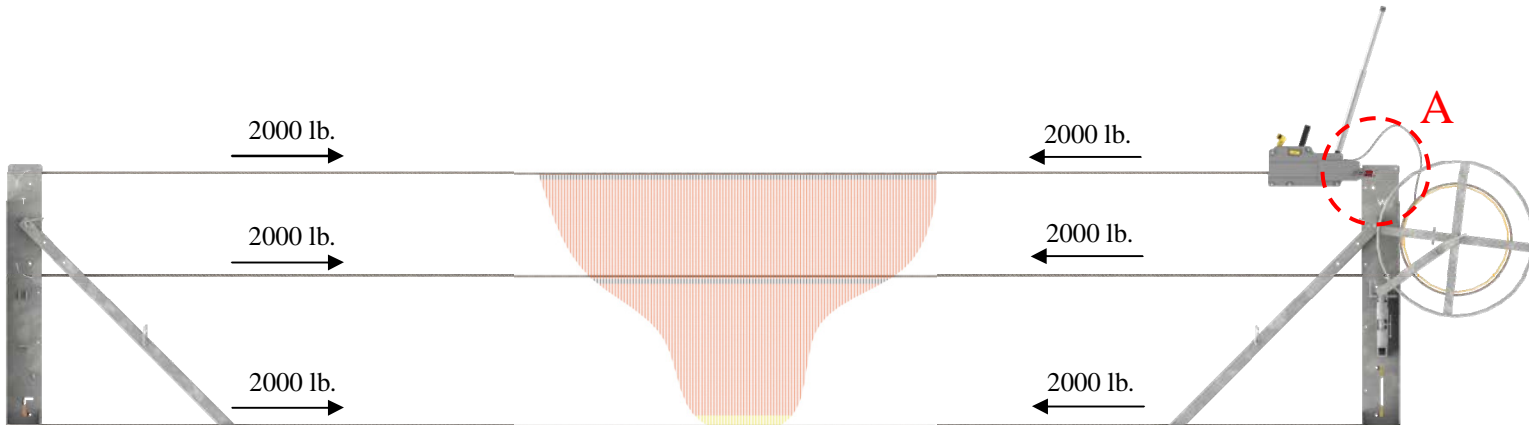
- Tie the 2 netting edges together above the top rail wire using the supplied nylon cable ties (120 lb. breaking strain) on 2' spacing.



Tensioning the Cable

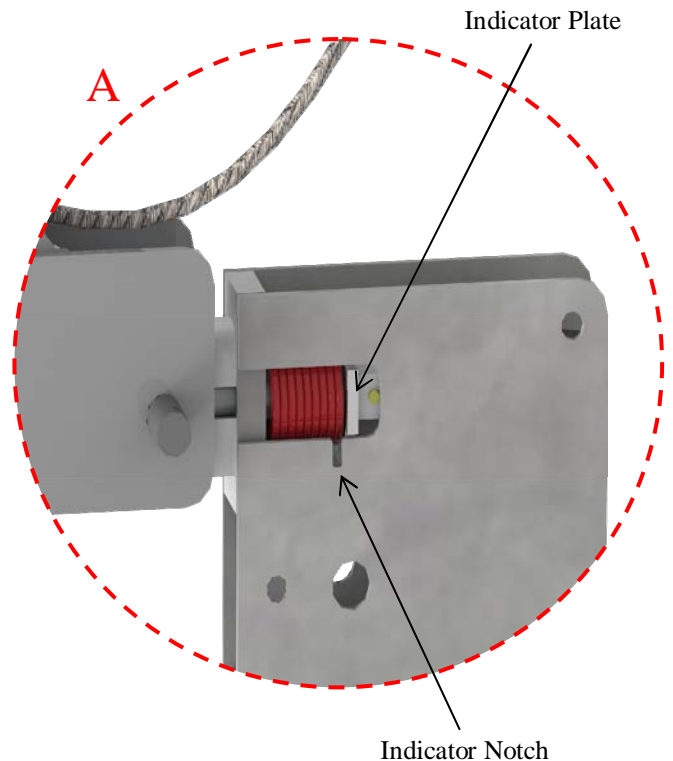
STEP 1:

- For the purposes of this manual, bolt down posts are used in the following diagrams.
- Fully tension the wire rope after the debris netting has been fully installed.
- Guide posts will be installed against the fully tensioned wires.



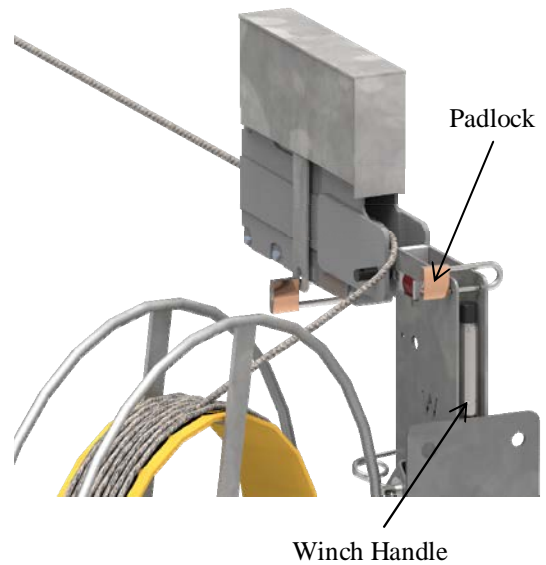
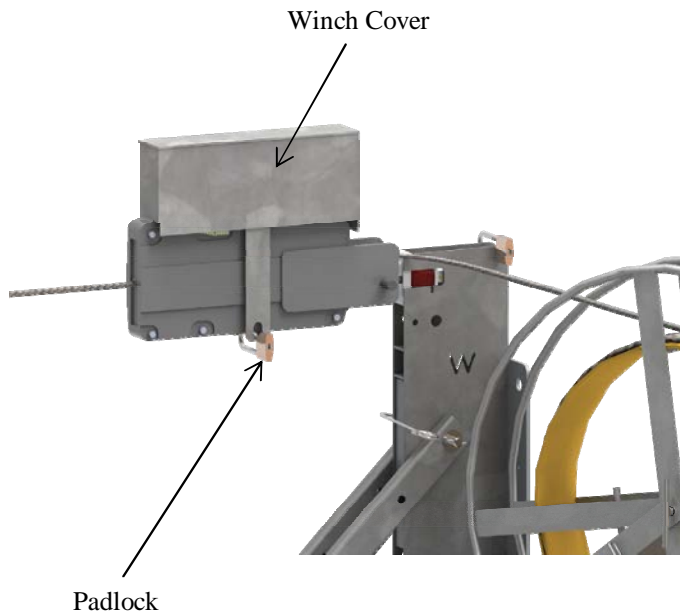
STEP 2:

- Tension the wire until the indicator plate behind the spring is centered over the indicator notch.
- A single fully tensioned wire will apply up to 2,000 lb. of force to each wire rope member.
- Therefore this will exert 6,000 lb. of tension on each anchorage.
- If you over tension the wire the brass shear pin on the winch's rear lever will shear.
- Spare brass shear pins are located in the T handle under the clear plastic plugs. Always bring spare shear pins to the installation.
- Store excess wire rope on the reel.



STEP 3:

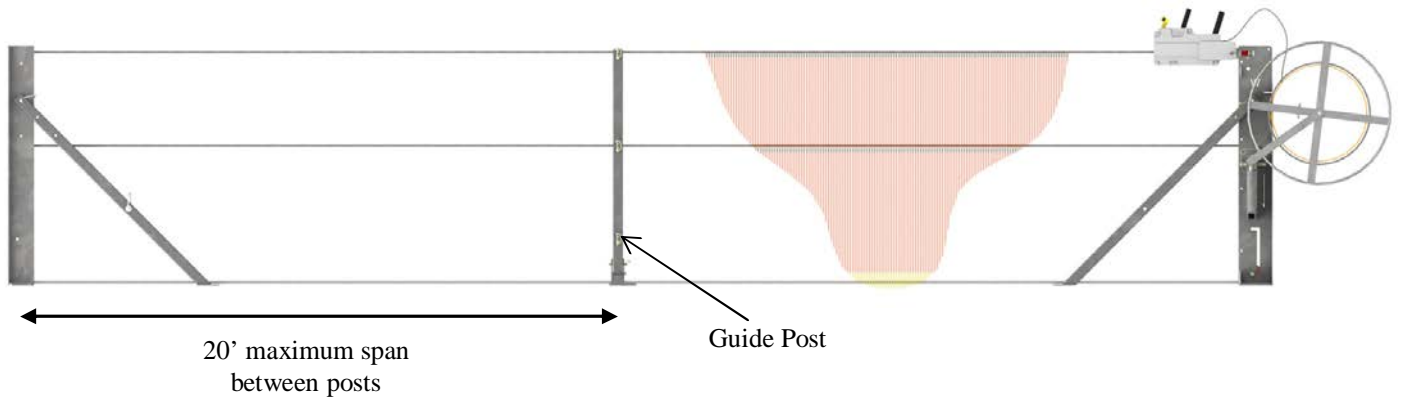
- Install the lockout winch cover with padlock to prevent tampering.
- Order additional padlocks as needed from Superchute.
- All RopeRail padlocks are keyed alike (the same key opens all padlocks).
- The winch handle can be stowed in the winch post and padlocked to prevent theft.



Installation of the Intermediate Guide Posts

STEP 1:

- An intermediate Post is required every 20' to prevent downward deflection of the top wire below OSHA mandated 39"
- Specific drilling templates are provided for the Intermediate Posts.



STEP 2:

- When RopeRail is installed as a Full Height System, the intermediate post allows you to clamp the wire rope to the slab.
- Rotate until the swing clamp pinches the wire and the netting against the slab.
- Lock the clamp using the supplied pin.



STEP 3:

- Force the enveloped wire between the protruding steel flange pair of the post.
- The RopeRail wire should be sandwiched between the netting and trapped by the post flanges.
- Use the supplied pin to lock the wire & netting to the post.



APPENDIX

All drawings in the Appendix can be downloaded at www.roperrail.com

200 ft [60 m] RopeRail® Wire Rope Guardrail System Bolted to Columns

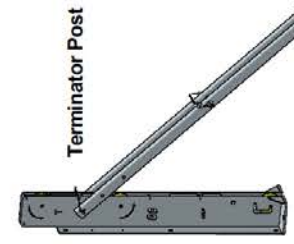
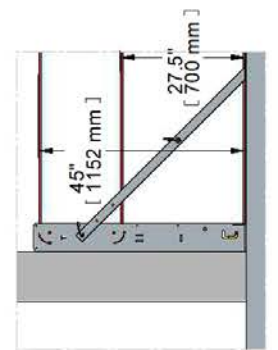
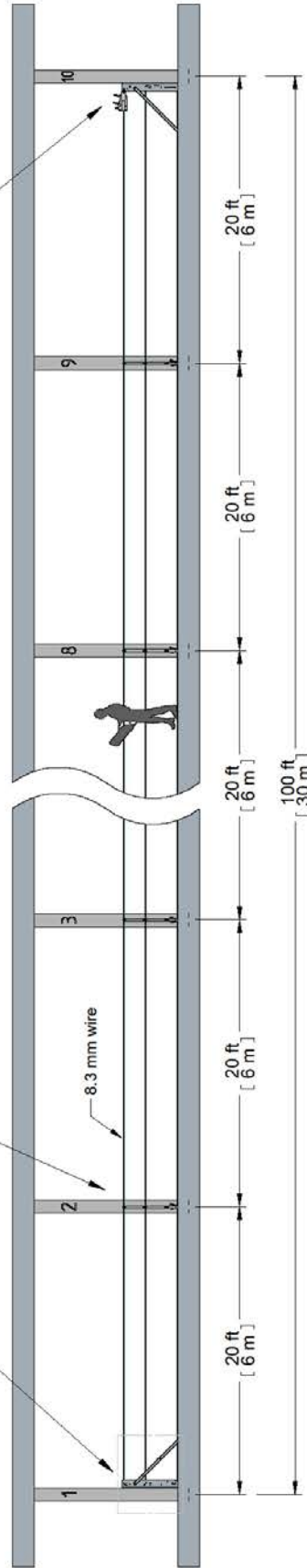
The 45° tall guardrail can be overlaid with optional RopeRail Debris Net, which is secured every 5 feet to the top most wire and bottom wire with disposable nylon ties. The addition of netting reduces the risk of objects falling or blowing through the guardrail and injuring persons below.

A structural engineer must verify the adequacy of the supporting structure

- 45° Intermediate Post**
- The Intermediate Post is used to stiffen & prevent deflection of the wire
 - Heavy duty galvanized steel construction
 - 3 supplied locking pins are used to secure wire rope to the post
 - Integrated clamp located at the bottom of the post is used to lock the wire rope down onto the slab
 - Must be bolted to deck slab
 - Required every 20'
 - 8 Intermediate Posts required per 200' RopeRail® System

- 45° Terminator Post**
- The Terminator Post is the end point of a RopeRail® System
 - Heavy duty galvanized steel construction
 - Pin off point for the swaged eye at end of wire rope
 - Bolted to deck slab or onto wall slab
 - 3 integrated pulleys

- 45° Winch Post**
- The Winch Post is the starting point for a RopeRail® System
 - Heavy duty galvanized steel construction
 - Built-in spring load indicator for winch
 - Bolts to deck slab or onto wall slab
 - 2 integrated pulleys



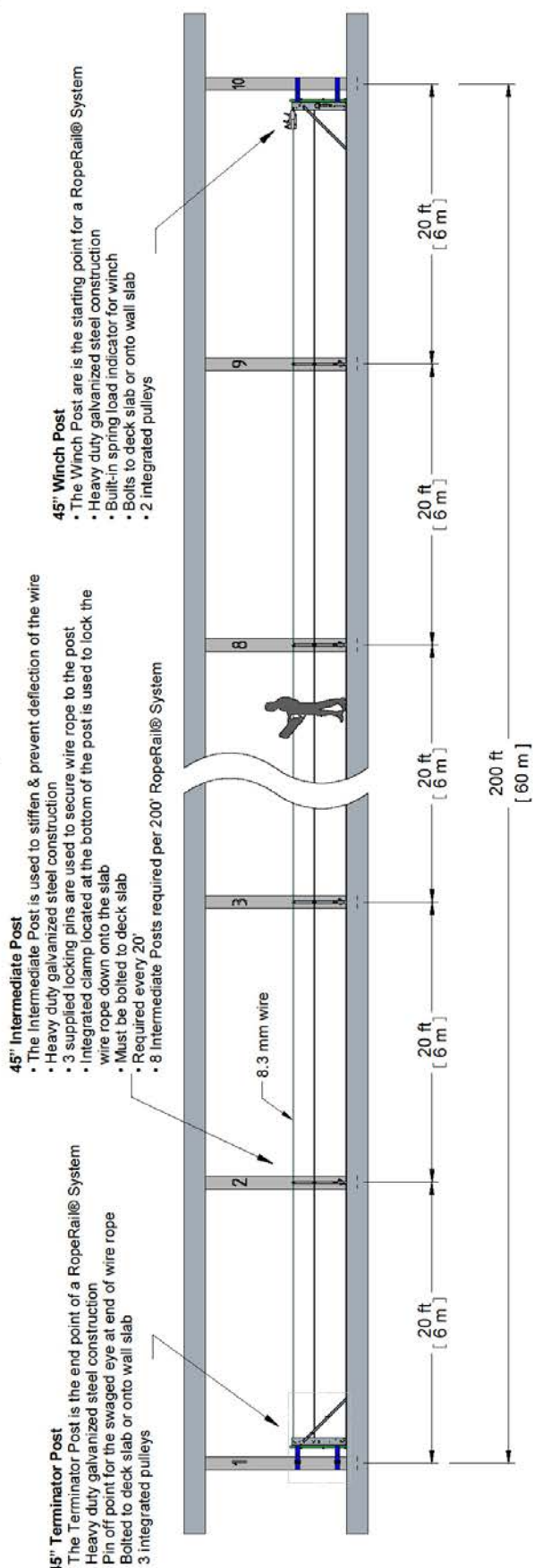
SUPERCHUTE®	
PROJECT	200 ft RopeRail System
DATE	July 12, 2016
PHONE	1-800-363-2488

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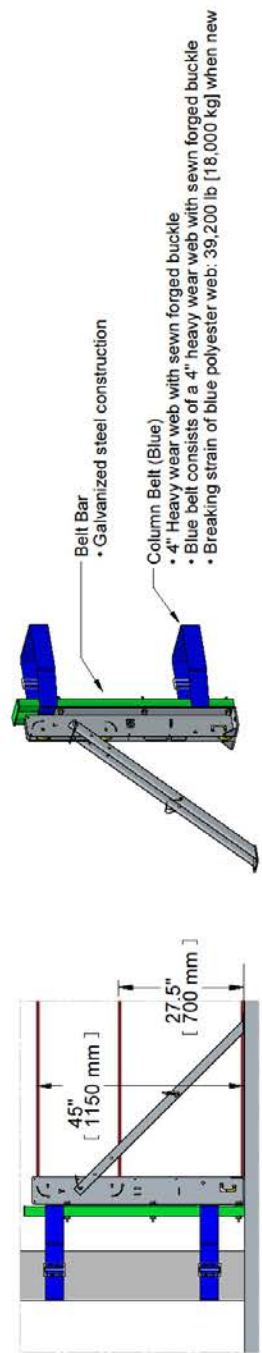
200 ft [60 m] RopeRail® Wire Rope Guardrail System Using Column Belts

The 45° fall guardrail can be overlaid with optional RopeRail Debris Net, which is secured every 5 feet to the top most wire and bottom wire with disposable nylon ties. The addition of netting reduces the risk of objects falling or blowing through the guardrail and injuring persons below.

A structural engineer must verify the adequacy of the supporting structure



- 45° Terminator Post**
- The Terminator Post is the end point of a RopeRail® System
 - Heavy duty galvanized steel construction
 - Pin off point for the swaged eye at end of wire rope
 - Bolted to deck slab or onto wall slab
 - 3 integrated pulleys
- 45° Intermediate Post**
- The Intermediate Post is used to stiffen & prevent deflection of the wire
 - Heavy duty galvanized steel construction
 - 3 supplied locking pins are used to secure wire rope to the post
 - Integrated clamp located at the bottom of the post is used to lock the wire rope down onto the slab
 - Must be bolted to deck slab
 - Required every 20'
 - 8 Intermediate Posts required per 200' RopeRail® System
- 45° Winch Post**
- The Winch Post are the starting point for a RopeRail® System
 - Heavy duty galvanized steel construction
 - Built-in spring load indicator for winch
 - Bolts to deck slab or onto wall slab
 - 2 integrated pulleys



- Belt Bar**
- Galvanized steel construction
- Column Belt (Blue)**
- 4" Heavy wear web with sewn forged buckle
 - Blue belt consists of a 4" heavy wear web with sewn forged buckle
 - Breaking strain of blue polyester web: 39,200 lb [18,000 kg] when new



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