



Product Technical Guide and Instruction Manual

2018 Edition

Permanent Suspended Maintenance and Fall Protection Anchorages

Pipe Anchors

Plate Anchors

Davits

Rigging Sleeves

Monorails

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Design Features: STRONGTOP™ PERMANENT SUSPENDED MAINTENANCE

Engineered Supply's fall protection components, including our **STRONGTOP™ PERMANENT SUSPENDED MAINTENANCE** plate anchors, pipe anchors, davits, and rigging sleeves, can be used for permanent application in any climate on concrete, structural steel, timber, and locally reinforced wood building structures.

Our **STRONGTOP™** products offer a number of advantages:

- **Ease of Connection:** Our large anchor hoop, made from 3/4" diameter high-strength steel allows for ease of connection and lower side-gate loading.
- **Maximum Capacity:** The anchor hoop is inserted into holes in minimum 1/2" thick top plate and then welded for maximum capacity.
- **Roofing Boot Compatible:** Our hoop plate is designed to allow for standard roofing boot installation.
- **Designed for Strength:** Our plate and pipe anchors are designed to 1,250 pounds service load, 1,850 pounds impact force, 2,500 pounds test load, and 5,000 pounds ultimate (failure) load. The base plates on **STRONGTOP™** pipe anchors are designed for stiffness, in addition to strength to reduce deflection during testing.
- **Variety of Sizes:** **STRONGTOP™** pipe anchors are available in heights from 8 inches to 30 inches tall. **STRONGTOP™** plate anchors can also be sized according to customers' needs.



All of our **STRONGTOP™** products are

- Rated for standard fall protection, fall restraint, and suspended maintenance loads and are built to meet and surpass building code allowable stresses, when properly maintained.
- Made by certified welders in the United States.
- Inspected by Engineered Supply personnel prior to delivery.
- When applicable, available in custom finished structural steel, stainless steel, and aluminum.
- Sample-tested to failure loading in order to verify capacities.



Design Loading: STRONGTOP™ PERMANENT SUSPENDED MAINTENANCE

Engineered Supply's components, including our **STRONGTOP™ PERMANENT SUSPENDED MAINTENANCE** plate anchors, pipe anchors, davits, and rigging sleeves, are designed to resist loads as a product in conformance with ANSI / IWCA I-14 Window Cleaning Safety Standard to the standard design loads listed below and reviewed for conformance with the applicable Federal OSHA requirements for suspended maintenance and fall protection anchorage.

Engineered Supply **STRONGTOP™** products utilize building grade materials and consider ductility a requirement. Products that bend prior to breaking offer a superior advantage over brittle materials that may fail suddenly without warning when overloaded.

Our **STRONGTOP™** products offer the following design load capacities

- **5,000 pound minimum ultimate load:** Ultimate loads are often referred to as breaking loads. Ultimate load capacities are calculated, and often controlled by the plastic section modulus of the material and the minimum yield strength of the material. A sampling of each of our anchor types are test loaded to 5,000 pounds to verify our calculated design loads.
- **2,500 pound minimum test load:** Field test loading is required for each installation. Our test load capacities are calculated, and are often controlled by the elastic section modulus of the material and the minimum yield strength of the material. Engineered Supply **STRONGTOP™** products are designed so that they do not permanently deform at test loading by maintaining stresses within the material's elastic limits.
- **1,800 pound minimum impact load:** Engineered Supply **STRONGTOP™** products are designed for the maximum fall arrest OSHA impact load.
- **1,250 pound minimum service load:** Service loads are the maximum repetitive load that **STRONGTOP™** products are designed to withstand from a fatigue standpoint.

Code Application: STRONGTOP™ PERMANENT SUSPENDED MAINTENANCE

Engineered Supply's components, including our **STRONGTOP™ PERMANENT SUSPENDED MAINTENANCE** plate anchors, pipe anchors, davits, and rigging sleeves, are designed as a product in conformance with ANSI / IWCA I-14 Window Cleaning Safety Standard to the allowable stresses recognized by AISC building code standards, and reviewed for conformance with the applicable Federal OSHA requirements for suspended maintenance and fall protection anchorage.

Our **STRONGTOP™** products offer a number of advantages:

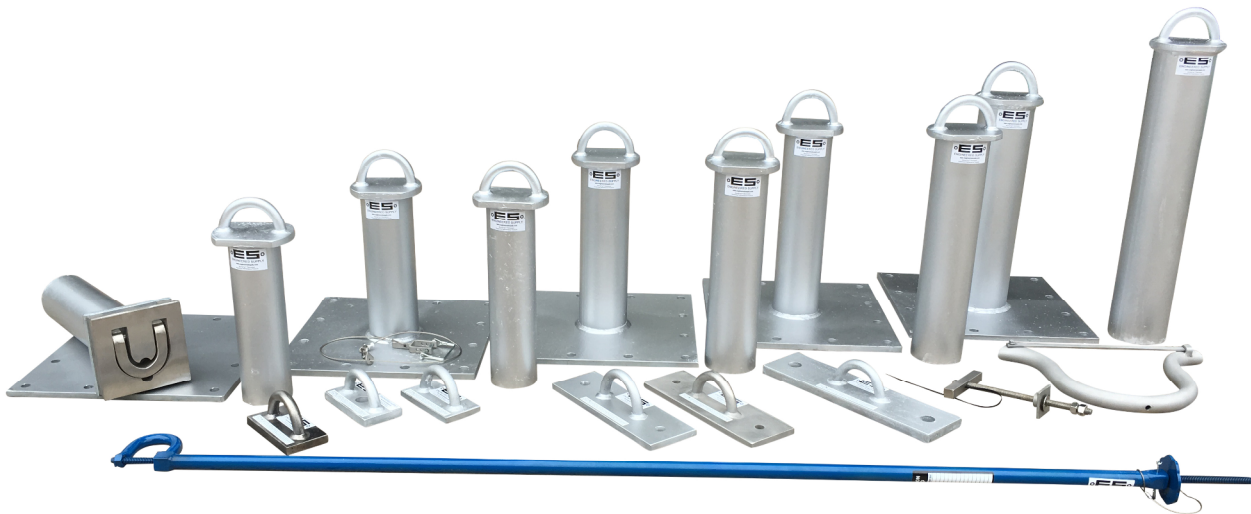
- **ANSI / IWCA I-14 Compliant:** Our anchorages are designed for ultimate loading, test loading, and service loadings in accordance to the American National Standard Institute and the International Window Cleaning Association. Our extensive engineering, testing, and field experience provide designs that work by the code and in the field.
- **AISC Materials and Stress Compliant:** Our anchors are made from building grade steel and designed in accordance to the allowable service load stresses of the American Institute of Steel Construction. This includes our ductile steel hoop, which is formed from a 50 ksi yield strength material to a calculated and tested 1.625" inside radius.
- **OSHA Compliant:** Our anchorages are reviewed for compliance with Federal Occupational Safety & Health Administration standards. In addition to compliant anchorages, on request Engineered Supply provides anchorage layouts in accordance to best industry standard for compliant systems.

In-Stock Products

Engineered Supply stocks a large selection of roof and wall anchors. Special pricing is available for in-stock anchorages due to cost benefits from mass production. In addition, Engineered Supply has a selection of miscellaneous anchors in stock for specialty needs.

The following anchors are typically in stock:

- **STRONGTOP™** Universal Pipe Anchor in 12, 14, 16, 18, and 24 inch pipe sizes, Hot Dip Galvanized Finish
- **STRONGTOP™** Standard Plate Anchor, Hot Dip Galvanized Finish
- **STRONGTOP™** Standard Plate Anchor, Stainless Steel
- **STRONGTOP™** Wide Plate Anchor, Hot Dip Galvanized Finish
- **STRONGTOP™** Welded Plate Anchor, Plain Finish
- **STRONGTOP™** Welded Plate Anchor, Hot Dip Galvanized Finish
- **STRONGTOP™** Narrow Plate Anchor, Hot Dip Galvanized Finish
- **STRONGTOP™** Welded Pipe Anchor in 12, 14, 16, 18, 24, and 30 inch pipe sizes
- **STRONGTOP™** Patio Pipe Anchor with loose shipped 16 inch pipe length for field adjustment
- **STRONGTOP™** Cable Fuse Shock Absorber for Horizontal Life Lines, Stainless Steel
- **STRONGTOP™** Hooking Stick
- **STRONGTOP™** Structural Toggle Bolt, Stainless Steel

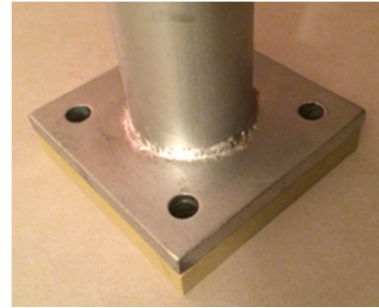
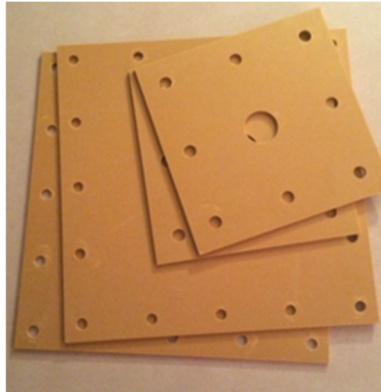


Options and Additions

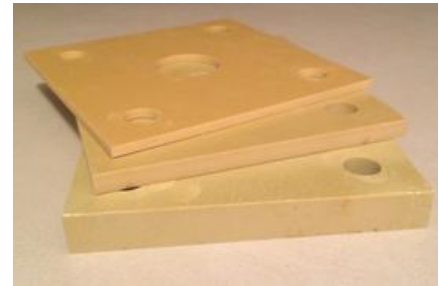
Thermal Insulation Material

Engineered Supply's thermal insulation separation material offers a thermally efficient, energy-saving installation that reduces thermal bridging in the connection of roof anchors to the building structure. Made from a fiberglass-reinforced laminate composite, our thermal insulation separation material is a load bearing "thermal break" that maintains structural integrity while reducing heat loss.

Our thermal installation separation material matches the bolt pattern of our **STRONGTOP™** suspended maintenance anchors



Engineered Supply's thermal insulation material can be custom-made for specialty bolted applications and is available in thicknesses of 1/4 in., 1/2 in., and 1 in.



Benefits

- Thermally efficient and saves energy
- Reduces thermal bridging and heat loss
- Load-bearing, high friction, load tested material
- Matches our **STRONGTOP™** suspended maintenance anchors and available in 3 thicknesses

Stainless Steel

Engineered Supply's stainless steel **STRONGTOP™** permanent suspended maintenance anchorages, made of 304 (18-8), have a high resistance to corrosion while maintaining the highest class of exposed finish. **STRONGTOP™** stainless steel anchors can be cut, certified welded, formed, machined, and otherwise fabricated readily to your specialty application. They are simple and easy to maintain, resulting in a high quality, pleasing appearance.



Benefits

- High resistance to corrosion
- Attractive finish
- Fabricated to meet your specialty application
- Easy to maintain

Custom Finish

Our coated hot dip galvanized carbon steel **STRONGTOP™** permanent suspended maintenance anchorages have a high resistance to corrosion while maintaining your specification of exposed finish. **STRONGTOP™** coated anchors can be cut, certified welded, formed, machined, and otherwise fabricated and finished readily to your specialty application. They are simple and easy to maintain, resulting in a high quality, pleasing appearance.



Benefits

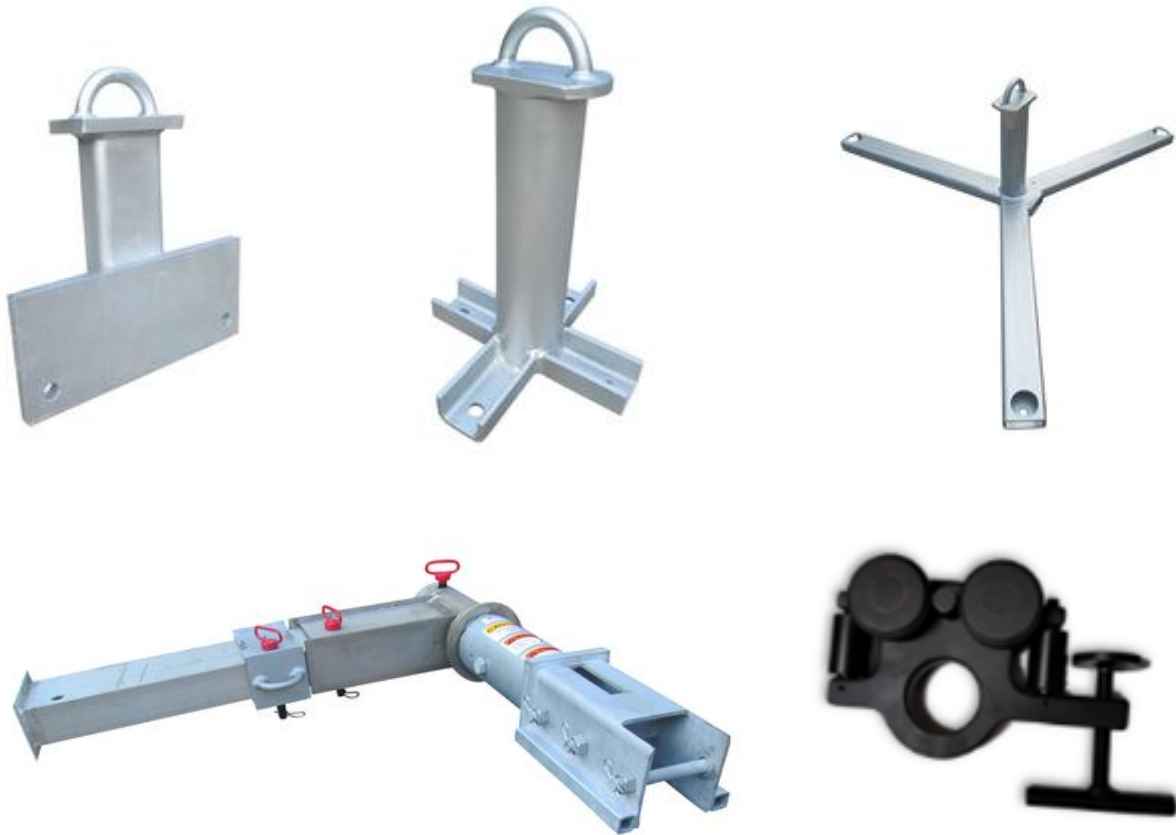
- High resistance to corrosion with powdercoat or epoxy over hot dip galvanizing
- Attractive finish colored to specification
- Specialty coatings to meet your specialty applications
- Finishes selected for ease of maintenance

Custom Equipment and Design

Engineered Supply's custom **STRONGTOP™** permanent suspended maintenance anchorages, made of aluminum, stainless steel, or carbon steel all have an engineered design, a high resistance to corrosion, and are tested to failure while maintaining the highest class of exposed finish to specification. **STRONGTOP™** anchors can be cut, certified welded, formed, machined, and otherwise fabricated readily to your custom application. They are simple and easy to maintain, conforming to industry and statutory standards.

Benefits

- Made to specification, or specified to meet your situation
- All custom designs independently reviewed and load tested to 5,000 pounds
- Fabricated to meet your specialty application
- Time-tested features incorporated into progressive detailing



Instructions: STRONGTOP™ PERMANENT SUSPENDED MAINTENANCE

SYSTEM USE

The purpose of these instructions is to provide the Building Owner or their Representative with information regarding inspection requirements and to provide an understanding of the installed equipment, usage, and maintenance, as well as information for the minimum inspections.

All users shall be properly trained on appropriate use of the equipment, as well as knowing and complying with OSHA, ANSI, and other applicable and pertinent life safety regulations.

Additional work is required beyond the scope of this manual such as 1) a written plan prepared by the contractor in accordance with applicable standards, 2) log books for the equipment, and 3) other requirements as determined necessary.

BUILDING OWNER'S RESPONSIBILITY

There is a shared responsibility between the Building Owner or their Representative and the Contractor using the equipment. The Building Owner or their Representative shall have the equipment inspected annually at a minimum and properly maintain the equipment, as well as maintain a record of inspections and maintenance.

BUILDING OWNER'S ASSURANCE TO CONTRACTORS

The Building Owner or their Representative shall provide the product literature, installation information, load testing reports, system certification, and the records of inspections and maintenance to the Contractor.

CONTRACTOR RESPONSIBILITIES AND CONTRACTOR WORK PLAN

The Contractor shall not permit employees to use the equipment prior to receiving the records of inspections and maintenance.

The Contractor shall submit written certification to the Building Owner or their Representative that employees have been trained on proper use of the equipment, as well as knowing and complying with OSHA, ANSI, and other applicable and pertinent life safety regulations.

The Contractor shall produce a written plan when utilizing this equipment. The plan shall include identification of hazardous areas, drop zones, safety features, and areas requiring protection for the public.

SYSTEM DESCRIPTION

EQUIPMENT USAGE REQUIREMENTS

Contractors using the equipment shall have a means of communication with the Building Owner or their Representative to facilitate emergency rescue procedures.

Adequate precautions shall be taken to protect the Engineered Supply equipment and systems from dirt and other contaminants, corrosive substances, heat producing processes, or other exposures which may be detrimental to the structural integrity of components.

EMERGENCY PROCEDURES

The following rescue procedures are to be incorporated as a minimum into the Contractor's written work plan.

If safety equipment failure is experienced the worker(s) should stop work and move to a safe area.

If suspended maintenance equipment failure is experienced while using suspended equipment, the worker(s) should immediately descend to the ground or other safe surface such as a roof. In the event that worker(s) cannot descend to the ground or reach a safe working surface, the worker(s) shall establish communication with security personnel notifying them as to the nature of the situation so that the appropriate procedures can be promptly implemented.

All workers shall familiarize themselves with communication procedures and exit routes with emphasis on the requirements of the written work plan in the event of an emergency.

SERVICE

Engineered Supply equipment shall not be modified without written consent from Engineered Supply.

Parts subject to wear such as pins, bearings, gears, and similar shall be replaced with new parts provided by Engineered Supply and installed by a service contractor recognized as competent by Engineered Supply in writing.

Parts exhibiting damage from corrosion or use shall be replaced with new parts provided by Engineered Supply and installed by a service contractor recognized as competent by Engineered Supply in writing.

INSPECTION

GENERAL

Suspended maintenance and safety equipment and systems shall be inspected for decay, damage, and conformance to the applicable current requirements at regular intervals and recertified under the direction of an experienced registered professional engineer at an interval not to exceed 10 years.

INSPECTION VERIFICATION

Prior to use, user(s) shall verify that maintenance and inspection logs indicate the system has been properly maintained and inspected.

FREQUENCY OF INSPECTIONS

NORMAL USE: Suspended maintenance and safety equipment and systems used for window washing and light maintenance such as caulking between one and six times per year shall be inspected annually by an Engineered Supply employee, Engineered Supply agent, or an experienced registered professional engineer.

INFREQUENT USE: Suspended maintenance and safety equipment and systems that are used less than once per year shall be inspected annually or prior to each use by an Engineered Supply employee, Engineered Supply agent, or an experienced registered professional engineer.

HEAVY USE: Suspended maintenance and safety equipment and systems that are used for construction activity such as masonry restoration, concrete restoration, window replacement, continuous operation or similar usage shall be inspected every 300 hours of use by an Engineered Supply employee, Engineered Supply agent, or an experienced registered professional engineer.

RECERTIFICATION: Suspended maintenance and safety equipment and systems shall be recertified at an interval not exceeding 10 years by an Engineered Supply employee, Engineered Supply agent, or an experienced registered professional engineer. Recertification shall be required after maintenance that affects the structural integrity of the equipment, to be completed prior to using the effected equipment. Recertification shall be required after failure of a system or accident involving the equipment, to be completed prior to using the effected equipment.

INSPECTION PROCEDURES

Engineered Supply equipment and systems require a thorough inspection and testing procedure to verify they are within the useful service life of the equipment. All equipment and systems shall immediately be taken out of service when not in proper working order.

If any equipment is removed from the building for inspection, testing, or re-certification, all installed or directly related components shall be re-inspected prior to returning the equipment to service.

Parts subject to wear such as pins, locks, bearings, and gears shall be inspected to determine that they have not worn to such an extent as to affect the safe operation of the system.

Inspection procedures shall incorporate methods to identify dirt and other contaminants, corrosive substances, heat producing processes, or other exposures which may be detrimental to the structural integrity of components.

The results of inspections and tests shall confirm that the Engineered Supply equipment and systems are functioning properly or include the recommendations for repair, replacement, removal from service, or further inspections required prior to use. Any equipment or systems found not to be functioning properly shall be labeled with a high visibility tag stating DO NOT USE with the inspectors initials, inspection company, and date of inspection clearly printed on it.

Systems that incorporate epoxy adhesive fasteners shall include complete load testing of each fixture during recertification. All load testing shall be witnessed and documented by an experienced registered professional engineer, or qualified person under the direct supervision of an experienced registered professional engineer.

Inspection procedures shall comply with OSHA, ANSI, IWCA, and other applicable laws, regulations, and industry standards.

INSTRUCTIONS

WARNING

Engineered Supply **STRONGTOP™ PERMANENT SUSPENDED MAINTENANCE** products are part of a personnel riding system, fall arrest system, or fall restraint system. The user must read and follow the manufacturer's instructions for each component or part of the complete system.

These instructions must be provided to the user of this equipment.

The user must read and understand these instructions or have them explained to them before using this equipment. Manufacturer's instructions must be followed for proper use and maintenance of this product.

Alterations or misuse of this product or failure to follow instructions may result in serious injury or death. Some subsystem and component combinations may interfere with the operation of the equipment.

IMPORTANT

If you have questions on the use, care, or suitability of this equipment for your application, contact Engineered Supply at 651.439.0932, 201 2nd Ave S, Bayport, MN, info@engineeredsupply.com.

Only Engineered Supply, or persons or entities authorized in writing by Engineered Supply, shall make repairs or alterations to equipment.

Refer to the project specific installation materials for additional information and requirements.

LIMITATIONS

When installed properly, the maximum working load for Engineered Supply **STRONGTOP™** products when used for suspended maintenance is 1,250 lbs applied in the direction as shown in the project specific installation materials.

When installed properly, the maximum user weight for Engineered Supply **STRONGTOP™** products when used for single person fall arrest with compatible OSHA compliant shock absorbing lanyard is 310 lbs applied in the direction as shown in the project specific installation materials.

Use of this equipment in areas where environmental hazards exist may require additional precautions to limit the possibility of injury to the user or damage to the equipment. Hazards may include, but are not limited to: high heat, caustic chemicals, corrosive environments, high voltage power lines, explosive or toxic gases, moving machinery, and sharp edges.

This equipment is required to be installed and used by persons trained in its correct application and use.

OPERATION AND USE

BEFORE EACH USE of this equipment, carefully inspect it according to the equipment manual.

PLAN your system before using this equipment. Consider all factors that will affect your safety during use of this equipment.

Consider the following points when planning your system:

A. HAZARD EVALUATION: An evaluation of job site hazards is necessary before starting work. Consult applicable OSHA and industry standards for guidelines and regulatory requirements on issues such as personnel fall arrest systems, and single point suspended scaffolds.

B. WORK SITE GEOMETRY: When suspending working lines from the davit arm, check for obstructions or sharp edges in the work path. Avoid working where the user may swing and hit an object, or where lines may cross or tangle with that of another worker.

C. BACKUP FALL ARREST SYSTEM: When using the product as a support for suspending a worker for personnel riding applications, a separate, independent backup fall arrest system is required.

D. RESCUE: In the event of an accident with injuries or other medical emergency, it is critical to have a rescue system in place. Response time often plays an important role in the survival of an injured worker. It should be assumed that the fallen user will not be able to participate in their rescue. Users of this equipment must be trained in emergency procedures.

INSPECTION PRIOR TO USE

Step 1. Inspect all pins, bolts, and nuts to ensure they are secure and operate properly. Check for missing, substituted, damaged, loose, or altered parts.

Step 2. Components must be straight and free of cracks, dents, distortion, or any other damage.

Step 3. All fixtures must be secured and not damaged.

Step 4. Inspect entire system for corrosion which may weaken or otherwise affect parts in their function.

Step 5. All labels must be present and fully legible.

Step 6. Inspect each system component in accordance to manufacturer's instructions.

If inspection reveals an unsafe or defective condition, remove the component and effected system from service and destroy, or contact an authorized service center for repair.

CONNECTING EQUIPMENT TO THE STRONGTOP™ ANCHORAGE

The anchor is equipped with one attachment point. All equipment attached shall be rated for the manufacturer as acceptable for attachment to a 50ksi yield strength hot dipped galvanized mild steel 3/4" diameter rod with a 1-5/8" inside diameter radius.

Make only compatible connections at the attachment point. Connectors (hooks, carabineers, D-rings) must support at least 5,000 lbs. Connectors must be compatible in size, shape, and strength. Non-compatible connectors may unintentionally disengage (roll-out). Do not use non-locking connectors with this equipment.

TRAINING

It is the responsibility of the user and purchaser of this equipment to be trained in the correct care and use of this equipment. The user and purchaser must be aware of the operating characteristics, application limits, and consequences of improper use of this equipment.

MAINTENANCE, SERVICING, STORAGE

Periodically clean the exterior of the anchorage using water and mild detergent. Clean labels as required.

Replacement parts and additional maintenance and servicing procedures must be completed by an authorized service center.

Store this equipment in a clean environment. Avoid areas with chemical vapors. Inspect equipment after any period of extended storage.

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