SECTION XXXXX

MILLER SHOCK FUSION ANCHORS

PART 1 GENERAL

1.1 SYSTEM DESCRIPTION

A. Type of system required: Shock Fusion Anchors Use with Miller Lifeline or single point anchors

B. System location: Roof/ Wall/ Tower/ Fixed Ladder, Misc. Structure, etc…

C. Maximum number of workers on system at one time: ##

D. Systems environmental exposure: What are the service conditions (indoors, outdoors, corrosive environment)? What materials will be required (steel, hot dip galvanizing, stainless steel, marine grade stainless etc…)?

E. Workers task while on the system: Workers will walk along edge. Occasionally, workers are required to look over the edge. While walking, workers need to carry heavy objects.

F. Type of fall protection required: Fall Arrest

G. Additional information: Supporting Documents

H. Insurances required: Commercial Liability and Workers' Comp.

1.2 RELATED SECTIONS

A. Section 03300 - Cast-In-Place Concrete

B. Section 03400 - Pre-Cast Concrete

C. Section 05100 – Structural Metal Framing

D. Section 05400 – Cold Formed Metal Framing

E. Section 05310 - Metal Deck

F. Section 06100 – Rough Carpentry

G. Section 07510 - Built-Up Roofing

H. Section 07700 - Roof Specialties and Accessories

I. Section 11010 - Maintenance Equipment

1.3 REFERENCES

A. Occupational Safety & Health Administration (OSHA)

1. 29 CFR 1910.28 (b) (1) & 29 CFR 1926.501(b) (1) - Occupational Health and Safety Standards General Industry & Construction: Duty to have fall protection

2. 29 CFR 1910.140(c) (11) (i-ii) & 29 CFR 1926.502(d) (8) - Safety and Health Regulations for General Industry & Construction: Horizontal Lifeline Design Requirements.

3. 29 CFR 1910.140(c) (13) (i-ii) & 29 CFR 1926.502(d) (15) (i-ii) - Safety and Health Regulations for General Industry & Construction: Anchorage Design Requirements.

4. 29 CFR 1910.66 (e) (1) (i) - General Industry: Powered Platform Installations -Affected parts of buildings.

B. American National Standards Institute (ANSI)

1. Z359.1 [2016] – The Fall Protection Code

2. Z359.3 [2017] – Safety Requirements for Positioning and Travel Restraint Systems.

3. Z359.6 [2016] – Specifications and Design Requirements for Active Fall Protection Systems.

4. Z359.11 [2014] – Safety Requirements for Full Body Harnesses.

5. Z359.12 [2009] – Connecting Components for Personal Fall Arrest Systems.

6. Z359.13 [2013] – Personal Energy Absorbers and Energy Absorbing Lanyards.

7. Z359.14 [2014] – Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems.

8. Z359.15 [2014] – Safety Requirements for Single Anchor Lifelines and Fall Arrester for Personal Fall Arrest Systems.

9. Z359.18 [2017] – Safety Requirements for Anchorage Connectors for Active Fall Protection Systems.

C. Materials, Bolting, Finishing: American Society of Testing Materials (ASTM)

1. A36 - Standard Specification for Carbon Structural Steel.

2. A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

3. A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

4. F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105 KSI Yield Strength.

5. A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications

6. A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

7. A666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

8. A992 - Standard Specification for Structural Steel Shapes.

9. F3125 - Standard Specification for High Strength Structural Bolts, Steel and Alloy, Heat Treated, 120ksi and 150ksi Minimum Tensile Strength, Inch and Metric Dimensions.

D. American Welding Society (AWS) D1.1/D1 - Structural Welding Code – Steel

E. Design Standards

1. International Building Code (IBC) [20XX] – Building Design Manual

2. American Society of Civil Engineers (ASCE/SEI) 7-10 [20XX] – Minimum Design Loads for Buildings and Other Structures

3. American Institute of Steel Construction (AISC) 360-XX [XXth ed.] – Steel Construction Manual. In accordance with local building code and adopted standards.

4. American Concrete Institute (ACI) 318-11 Building Code Requirements for Structural Concrete.

5. National Design Specification (ANSI/NDS) [20XX] – Wood Construction Manual

F. Definitions

1. Anchorage – per ANSI Z359.0 – A secure connecting point or a terminating component of a fall protection system capable of supporting impact forces applied by a fall protection system.

2. Anchorage Connector – per ANSI Z359.0 – A component or subsystem that functions as an interface between the anchorage and a fall protection, work positioning, rope access or rescue system for the purpose of coupling the system to the anchorage.

3. Clearance – per ANSI Z359.0 – The distance below an authorized person that must remain clear of obstructions in order to ensure that the authorized person does not make contact with any objects that would cause injury in the event of a fall.

4. Continuous Fall Protection – per ANSI Z359.0 – One or more fall protection systems that provide fall protection without interruption.

5. Fall Arrest – per ANSI Z359.0 – The action or event of stopping a free fall or the instant where the downward free fall has been stopped.

6. Fall Hazard – per ANSI Z359.0 – Any location where a person is exposed to a potential free fall.

7. Fall Restraint/Travel Restraint – per ANSI Z359.0 – A combination of anchorage, anchorage connector, lanyard (or other means of connection) and body support (full body harness) that limits travel in such a manner that the user is not exposed to a fall hazard.

8. Qualified Person – per ANSI Z359.0 – A person with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, evaluating and specifying fall protection and rescue systems to the extent required by the Z359 standards.

1.4 PERFORMANCE

A. System shall comply with 1.1 System Description

B. Performance Requirements

1. System Performance

a. The Anchor Post(s) shall provide a secure attachment means to the supporting structure in conjunction with the manufacturer’s requirements. The Anchor Post shall provide compatible connections with the applicable anchorage connector. All components shall be designed by the fall protection system

supplier and shall meet the applicable fall protection ANSI standards and applicable OSHA regulations.

b. The Fall Protection Horizontal Lifeline System shall be designed to allow users to walk the entire length of the system without having to disconnect from the system to pass through intermediate support points. The system shall be designed to support required number of users in case of a fall and to prevent the users from free falling more than 6 feet. All components shall be designed by the fall protection system supplier and shall meet the applicable fall protection ANSI standards and applicable OSHA regulations.

2. Structural Performance:

a. Structure supporting Shock Fusion Anchor(s) must be capable of withstanding the design loads as required by governing regulations and codes. Where component design loads are specified herein, they represent design minimum requirements.

b. All fall protection components shall be designed with a minimum 2:1 safety factor.

1.5 DESIGN

A. Design Requirements

1. Shock Fusion Anchor shall comply with current applicable OSHA, ANSI, and state regulations and standards.

2. The Shock Fusion Anchor and any supporting structure shall be designed by:

Miller
1345 15th Street
Franklin, PA 16323

Phone: 1-800-325-6746
Website: www.millerfallprotection.com
E-mail: millertechexpert@sperianprotection.com.

Gravitec Systems Inc.
21291 Urdahl Road NW,
Poulsbo, WA 98370-7124

Phone: 1-800-755-8455
Website: www.gravitec.com
E-mail: solutions@gravitec.com.

3. General Requirements:

a. Shock Fusion Anchor (s) connection to structure shall be designed and installed, under the supervision of a Qualified Person, as part of a complete personal Fall Protection system.

b. Shock Fusion Anchor energy absorbers shall not be used to limit the maximum arrest force of the worker. Shock Fusion Anchor

energy absorbers shall be used only to control or reduce the maximum arrest load on the structure.

c. The design engineer shall ensure the increased clearance requirements of a deployed Shock Fusion Anchor will not conflict with the required clearance of the system.

d. Shock Fusion Anchor (s) shall satisfy the seismic conditions for nonstructural components as described by ASCE/SEI 7 and the most current edition of the IBC. No exceptions can be taken if the system is required to function for life-safety purposes after an earthquake.

e. Brackets and supports shall be attached to the structure with appropriate anchors of proper size to adequately support the intended loaded.

f. The designer shall take into account environmental factors (snow, ice, debris, etc...) when designing a Shock Fusion Anchor such that the Shock Fusion Anchor functions properly.

g. The Shock Fusion Anchor(s) shall comply with Miller design requirements.

4. Restraint Shock Fusion Anchor(s) shall be designed per ANSI Z359.2 & ANSI Z359.6:

a. The Shock Fusion Anchor(s) shall prevent workers from reaching and falling into any open hole or off the edge of a working surface.

b. The Shock Fusion Anchor(s) shall comply with the requirements for fall arrest Shock Fusion Anchor(s) as indicated in this document.

c. Where a worker is using a full body harness the force on the worker’s body shall not exceed 400 lbs.

d. Shock Fusion Anchor(s) may be used in restraint systems; provided that the engineer has determined that the restraint forces will not cause the Shock Fusion Anchor(s) to deploy and ensures that the Shock Fusion Anchor extension in combination with other deformations of the restraint system will not permit the worker(s) to reach the fall hazard.

e. The use of fall restraint systems shall be limited to surfaces at or less than a slope of 4:12 from the horizontal. This is so a fall will not result in dynamic loading on the fall restraint system or where the authorized person could end up being suspended vertically from the system.

4. Fall Arrest Shock Fusion Anchor(s) shall be designed per ANSI Z359.2 & ANSI Z359.6:

    a. The selection, design, and installation of fall arrest Shock Fusion Anchor(s) shall be performed under the supervision of a Qualified Person.

    b. Anchorages designed for fall arrest systems shall have the strength capable of sustaining static loads applied in the directions permitted by the system of at least two times the maximum arresting force.

    c. When more than one user is attached to a horizontal lifeline, the load on the lifeline can be determined using either lumped mass or sequential fall calculations as described in ANSI Z359.6 [6.3.6]

    d. The swing fall shall comply with ANSI Z359.6 [5.3]

    e. The clearance safety margin shall comply with ANSI Z359.6 [7.2.6.2]

5. Window Washing Anchor Posts (ANSI/IWCA I-14.1 9):

    a. Anchor Post shall provide independent fall arrest anchorages in addition to suspension line anchorages for each descent location as required by IWCA.

    b. Anchor Post shall be designed to be compatible with current window cleaning industry standard equipment (e.g. rope descent systems, Boatswain chairs, swing stages, transportable suspension devises).

    c. Design of the fall protection anchors, and equipment shall meet or exceed the following:

        I. Anchor Posts shall be capable of sustaining a 5000 lb minimum load or a minimum 4 to 1 safety factor, whichever is greater, in any direction that a load may be applied.

        II. Anchorages, if used for more than one lifeline, shall have the load factor multiplied by each the number of user.

        III. All Anchorages shall be connected to the structure using a minimum of two fasteners (e.g. bolts, epoxy anchors, threaded rod, etc...) per anchorage.

B. Sub-System Requirements

1. Harnesses and Vertical Lifelines (VLLs) used with the system shall comply with ANSI Z359.1

2. Connecting Components (carabiners and snaphooks) used with the system shall comply with ANSI Z359.12

3. Energy Absorbing Lanyards (EALs) used with the system shall comply with ANSI Z359.13

4. Self Retracting Lifelines (SRLs) used with the system shall comply with ANSI Z359.14

C. The fall protection system shall be used exclusively for its designed use and shall be marked to prevent other uses.

D. The design shall take into consideration the potential uses of and loads on the fall protection system, in order to facilitate the prompt rescue of workers who may fall while attached to the system.

1.6 SUBMITTALS

A. Submit under provisions of Section ##### – Submittal Procedures

B. Product Data: Miller' data sheet on each product to be used, including:

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations

3. Installation methods

C. Drawings and Calculations:

1. Drawings:

a. Show the layout of the system including where the system is located and the complete assembly of all components.

b. Include a specification of the number, location, and qualifications of workers using the system.

c. Clearly specify the equipment dimensions, materials, fabrication details, hardware, and installation instructions.

2. Calculations:

a. Calculations shall be prepared under the supervision of a registered Professional Engineer and Qualified Person.

b. Include a statement defining the type of system and indicating that the CRP attachment design is in accordance with the requirements of ANSI Z359.6.

3. The Professional Engineer who oversaw the design of the system shall affix their professional seal to each drawing and calculation package issued.

D. Operation and Maintenance Data shall be prepared per ANSI Z359.2 & ANSI Z359.6:

1. Include complete list of equipment replacement parts; identify each entry with the equipment description and part numbers.

2. Include technical information for servicing equipment.

3. Include legible “as-constructed” drawings of the installed system.

4. Include installation date and system owner’s name and address.

5. Include detailed operating procedures:

a. Written by a Qualified or Competent Person.

b. Identifying the Shock Fusion Anchor(s) location

c. Stating any safety precautions that shall be followed during access and egress.

d. Describing the limitation on use of system: maximum load, designated equipment, required clearance and maximum number of persons permitted to be attached to the system at one time.

e. Instructions for inspection, maintenance, and retirement of the system and all of its components, including how often inspection and maintenance are to be performed and a description of the qualifications required for persons performing these tasks.

f. Procedure for inspection:

I. Required or recommended inspection intervals.

II. Detailed instruction for inspecting each component of the system.

III. Description of acceptance or rejection criteria, including retirement criteria, of each component of the system.

IV. Fall protection procedures shall include a requirement that any incidents, including accidents or near misses, be investigated to determine if procedures can be improved.

6. Provide or direct the owner of the system or the employer of the workers using the system to develop and implement a rescue plan before the system is used.

1.7 QUALITY ASSURANCE

A. Single Source: Obtain all materials and equipment required under this section from a single supplier.

B. Designer/Installer Qualifications: Engage a single firm to assume undivided responsibility for the design and fabrication of all fall protection system components. Firm shall have a minimum of 5 years documented experience in the fabrication of such components similar to that required for this project. Additionally, the firm shall have a minimum of 5 years documented experience in the installation of such components and who offers a regular inspection and maintenance service on such systems.

C. Design Engineer: Employ a firm with a minimum of 10 years experience designing fall protection systems with a minimum of 5 systems installed in the previous 12 months. Who employs a registered Professional Engineer (PE), with evidence of being the principal PE on at least 3 fall arrest systems which have been in use for no less than 1 year prior to bid closing date.

D. Professional Engineer and Fall Protection Qualified Person: Shall oversee the fall protection systems' design, such that all component items meet the "Structural Performance" requirements, including sizing and spacing of all attachments to the building structure and verify the design is compliant with all applicable OSHA and ANSI standards. Additionally, they must prepare, stamp and sign all required calculations; while also approving the system designer's drawings.

E. Welding to be executed by certified welders in accordance with AWS requirements.

1.8 DELIVERY, STORAGE & HANDLING

A. Material delivery shall be coordinated with all effected entities.

B. Storage and Protection:

1. Store originally packaged materials in a cool, dry, and protected location.

2. Materials shall be in new condition and show no signs of damage.

1.9 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.10 WARRANTY

A. Manufacturer's standard one year warranty for materials and workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers shall comply with the *Quality Assurance* section of this documentation.

B. All supporting structure which connects the Shock Fusion Anchor(s) to the super structure shall be designed by:

Gravitec Systems Inc.
21291 Urdahl Road NW,
Poulsbo, WA 98370-7124

Phone: 1-800-755-8455
Website: www.gravitec.com
E-mail: solutions@gravitec.com.

2.2 PRODUCTS

A. Miller
1345 15th Street
Franklin, PA 16323

Phone: 1-800-325-6746
Website: www.millerfallprotection.com
E-mail: millertechexpert@sperianprotection.com.

2.3 MATERIALS

A. Product

1. The system shall be a complete and turnkey complying with the performance and design criteria of this document.

2. The Shock Fusion Anchor(s) shall be the product of Miller.

3. Components: All system connectors, cables and bolts shall be stainless steel Type 316 or epoxy coated aluminum. Fabricated supports required for additional support may be carbon steel with a corrosion resistant coating. However a faying surface shall be used to prevent galvanic reactions.

4. Post Base Plate Connectors: Provide complete with required components for weatherproof mounting to the following surfaces:

   a. Standing Seam Roof Type.

   b. Composite Ribbed Roofing Type.

c. Metal Roofing Type.

d. Insulated Roof Deck Type.

e. Concrete Deck Type.

f. Timber Deck Type.

g. Non-Penetrating.

5. The Shock Fusion Anchor(s) shall be attached to the supporting structure with appropriate fasteners. The fasteners shall be designed to support a load on the fall protection system of 2 times the maximum design load without failure.

6. Provide all designed sub-system items per Section 1.5 (B) of this document.

B. Supporting Structure

1. Structural Components shall comply with the applicable standards:

a. Structural Steel: ASTM A36

b. Structural Tubing: ASTM A500 Grade B

c. Structural Bars, Plates, Shapes, and Sheet Piling: ASTM A6

d. Piping: ASTM A53

2. Fasteners shall comply with the applicable standards:

a. Structural Bolts: ASTM A325

b. Alloy-Steel and Stainless Steel Bolting: ASTM A193

3. Flashing and Sealing Material shall comply with the applicable standards:

4. Material substitutions shall be better than or equal to the requirements found in this section.

5 Fabrication

a. Fabricate work true to dimension, square, plumb, level, and free from distortion or defects detrimental to performance.

b. Coordinate the system with supporting structure.

c. Welding:

I. AWS D 1.1 as applicable.

II. If Butt welds are used, then surplus welding material is to be ground off to ensure exposed surfaces are smooth. Fillet welds shall not be ground.

III. Slag is to be removed from the materials surface.

6 Finishes

a. Hot Dipped Galvanizing: Comply with ASTM A123.

b. Powder Coat: Safety Yellow

2.4 SHOCK FUSION ANCHOR DESIGN

A. Shock Fusion Anchor design shall comply with the *Design Requirement* section of this document.

B. Steel design shall comply with AISC 14th ed.

C. Wood design shall comply with ANSI/NDS [2005]

D. Concrete design shall comply with ACI [2008]

E. Fall protection systems attached onto an existing or new structure shall comply with IBC [2009] and ASCE/SEI [2010]

PART 3 EXECUTION

3.1 INSTALLATION

A. Installation shall be performed by:

Gravitec Systems Inc.
21291 Urdahl Road NW,
Poulsbo, WA 98370-7124

Phone: 1-800-755-8455
Website: www.gravitec.com
E-mail: solutions@gravitec.com.

B. Install in accordance with approved shop drawings and manufacturer's instructions.

C. The Miller Fall Protection System shall be installed under the direction of manufacturer's authorized trained personnel and under the supervision of a Qualified Person.

D. Install anchorages and fasteners in accordance with their manufacturer's recommendations to obtain the allowable working loads published in the product literature and in accordance with this specification.

E. Do not load or stress the Miller Fall Protection System until all materials and fasteners are properly installed and ready for service.

F. Where bolting is used for fastening, no fewer than three threads are to be exposed and the nut is to be positively locked using a thread-locking fluid or the double nutting technique.

G. Dissimilar materials with greater than 0.15V shall be separated by a faying surface.

H. Shock Fusion Anchors must be secured to roof surface with waterproof mechanical connectors as approved.

3.2 FIELD QUALITY CONTROL

A. After the Miller Fall Protection System is installed, Miller approved authorized Qualified or Competent Person shall inspect and operate the system and shall make all final adjustments for proper operation.

3.3 ADJUSTMENTS AND FINAL INSPECTION

A. Verify that all manufactured units have been installed in accordance with specifications and details, and will function as intended. Adjust any items where necessary to ensure proper operation.

B. Provide a complete drawing set with any revisions to the design or layout of the fall protection system during installation.

3.4 OPERATOR TRAINING

A Provide a minimum of 4 hours of operator training after system has been installed. Training is to be for the users of the system conducted at the installation site.

3.5 MAINTENANCE, INSPECTION AND TESTING

A. Provide manufacturer maintenance, inspection and testing instructions.

B. Provide documentation that is consistent with applicable OSHA and ANSI standards.

END OF SECTION

ShockFusion HLL System End & Corner Post

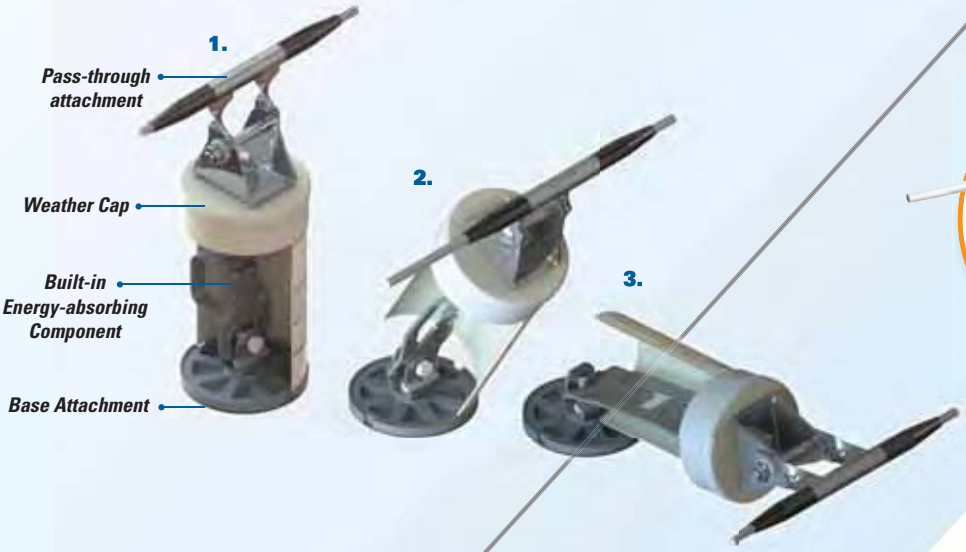
PATENT-PENDING TECHNOLOGY

In the event of a fall, the Miller ShockFusion End & Corner Roof Posts' "non-tip-over" design absorbs energy and reduces line deflection that results in less fall clearance required.

ShockFusion Roof Post with Turnbuckle Tension Indicator

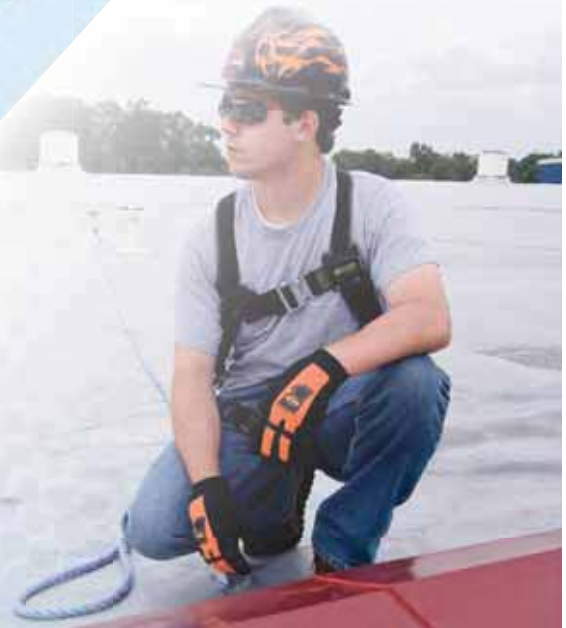
Fusion™ Intermediate Roof Post

Fusion™ Intermediate Posts absorb energy and orient forces close to the roof surface – Unlike end and corner posts, the tipping action of intermediate posts does not add to the lifeline length. It positions the line close to the roof surface for a reduction in force to the post base.



Fusion Roof Post with Bendable Pass-through Bracket

ShockFusion Roof Post with 45° Corner Bracket



Types of Horizontal Lifeline Roof Systems

Roof Penetrating Horizontal Lifeline Systems – are designed with rigid posts that minimize fall clearance but transfer high loads to the roof. Installation requires opening the roof to secure posts to the underlying structure, which increases installation time, cost and the potential for water leaks.

Competitive Surface-mounted Horizontal Lifeline Systems – are designed to attach to the roof surface but allow system end posts to tip over which increases fall clearance requirements.

Miller ShockFusion Horizontal Lifeline System – is designed to attach to the roof surface, reducing installation time, cost and possible roof leaks. The unique design of the end and corner posts manages system forces without tipping over to minimize fall clearance requirements.

Adapts to a Variety of Roof Structures

Standing Seam Design

- Aluminum clamping mechanism is designed to pre-install to the base plate and is self centering for easy installation.
- The clamping bolts are tightened from above the plate for easy fastening and inspection.
- Three models are available to accommodate standing seam spacing up to 24 inches *(610 mm)*.

Metal Sheathing Design

- Designed to attach to metal sheathing with a minimum 24 gauge *(0.024-inch [.61 mm])* thickness.
- Hardware kit includes sealing materials to prevent water damage to roof.

Membrane/Built-up Design

- Easy-to-install toggle kit fastens through membrane, insulation and into metal sheathing, wood sheathing or concrete.
- Models available for built-up roof thicknesses accommodate up to 10.5 inches *(267 mm)*.

Wood Design

- Includes lag screw kit.
- Installs into plywood with minimum thickness of 5/8-inch *(15.9 mm)* CDX.

Concrete Decking Design

- Includes concrete expansion anchor kit.
- Installs into concrete decking with minimum thickness of 6.5 inches *(165 mm)* and minimum concrete compressive strength of 3000 PSI *(20.7 MPa)*.

Universal Intermediate Brackets

Pass-through Design for 100% Connection

The automatic pass-through design allows for smooth passage of the Xenon® shuttle providing 100% connection to the system. The single-bolt design and easy-to-remove cable holder guide simplifies installation and maintenance. In the event of a load impact or fall, individual brackets can be replaced without disassembling or replacing the original wire rope. Available in adjustable or fixed-position styles for maximum versatility.

Xenon® Automatic Pass-through Shuttle

The Xenon Shuttle self-aligns for smooth pass-through of intermediate brackets. A double-locking mechanism ensures security, yet allows for easy, one-hand operation. With no moving pass-through parts, the shuttle is ideal for dusty, gritty or salty environments.

Miller Turbo T-BAK™

TurboLite™ Tie-Back Personal Fall Limiter

- Ideal for use with the **Miller ShockFusion Horizontal Lifeline System***
- **Integrated energy absorber** ensures the fall forces on the worker are reduced in the event of a fall
- **Xtreme performance webbing and the Miller 5K® Snap Hook** provide better edge protection in the event of a fall
- **7.5 ft.** ***(2.3 m)*** **working capacity** lifeline for added mobility

** When used with a ShockFusion System, the Turbo T-BAK PFL snap hook is connected directly to the Xenon shuttle. The snap hook does not get tied-back to the webbing.*

This equipment should only be used after reading and understanding the manufacturer's instructions. Failure to follow instructions could result in serious injury or fatality.

For more information, please contact Miller Engineered Solutions.

MILLER®
by Honeywell

Ask the Expert ... Ask Miller.

800/325-6746
or 814/432-2118

Fax 814/437-6711

www.millerfallprotection.com

LMSFB/0711/5M/RPI