Roof Specific
Rope Access Training

Full Level I Technician Certification
("AUTHORIZED PERSON")

Class Objective: *Provide Building Inspection Trades Professionals with the risk management skills necessary to eliminate the threat of personal injury associated with high angle roof inspection.*

"Day One"

7:45 am – 8:00 am - Sign-in -

NOTE: Summer schedule (May – Sept) training dates will begin an hour earlier at 6:45am.

- *PARTICIPANTS* fill out disclosure forms and class sign in sheet for Inspector CEUs.
- *INSTRUCTOR* will introduce training facilitators, convey all general housekeeping information.

8:00 am – 8:20 am - Managed Fall Protection Program Overview –

- *INSTRUCTOR* will outline class objectives, discuss risks involved with class participation and work with participants to develop class specific *RISK MANAGEMENT* plans for avoiding personal injury.
- *INSTRUCTOR* will discuss the concept of Roof Specific Rope Access Training as a means of improving the quality of inspection reports and reducing the threat for personal injury.

8:20 am – 9:20 am -Knots and Their Applications –

- *INSTRUCTOR* will introduce the different types of *LIFELINE* cordage and the knots used within a *BELAY SYSTEM*.
- *PARTICIPANTS* will learn the process for tying four *LIFELINE* knots (Super 8, Double Overhand locking knot, Fig 8 Follow Through and Butterfly knot), one webbing / flat cordage knot (Water Knot) and two knots with Prusik cord (opposing Triple overhand locking knots & Prusik knot).

9:20 am – 9:30 am – Class Break

9:30 am – 10:10 am - Equipment Selection, Care and Use –

- *INSTRUCTOR* will introduce the different types of *BELAY* components *(ASCENDERS, CONNECTORS, DESCENDERS, DECELORATORS & FALL ARRESTORS)* involved in constructing a *STATIC BELAY* system.
- Application, inspection, appropriate care for and retirement of *LIFELINE* components.
- Roof Specific Rope Access specific information provided on ladder selection, set-up, use considerations, *WORKING LOAD LIMITS*, the incorporation of ladder stabilizing products.

10:10 am – 11:00 am – Line Placement –

- *PARTICIPANTS* are provided a demonstration of (Comet Ball, Line Launcher II, Target Line and Rope Caddy) and given the opportunity to practice with *LIFELINE* positioning tools using *LINE PLACEMENT* techniques that are effective for up to Eight (8) stories / 100ft.

11:00 am – 11:30 am – Anchor Selection and Use –

- *PARTICIPANTS* provided information on the selection, set-up and use of three different types of *ANCHORS:*
  - *FIXED ANCHORS*
  - *WEIGHT BASED / PORTABLE ANCHORS*
  - *HUMAN ANCHORS* (Includes physical demonstration on practicality)

11:30 am – 12:00 - Static Belay System Assembly –

- *PARTICIPANTS* set up / build an actual *STATIC* (solo) *BELAY* system across an 8/12 pitch situated at ground level by securing two *ANCHORS* with webbing, *CONNECTORS*, rope and appropriate knots.

12:00 pm – 12:30 pm - On-Site Lunch (Provided)

12:30 am – 12:45 am – Body Harness Selection and Application –

- *INSTRUCTOR* will assist *PARTICIPANTS* with the understanding of how to properly identify, select and apply a full *BODY HARNESS* system.
  NOTE: *No PARTICIPANT will be allowed to move from the classroom to the climbing structures until they have completed a six point harness inspection with INSTRUCTOR.*

12:45 am – 1:45 pm – Low Level Belay Training –

- *PARTICIPANTS* led through a series of *DESCENDER* / Petzl "Rig" assisted ascents, descents and *BELAY TRANSFERS* under the direct supervision of class *INSTRUCTOR*.
- *PARTICIPANTS* familiarize themselves with *LIFELINE* assisted roof inspection process, build confidence in personal abilities to use equipment and demonstrate that they are competent to proceed to steeper and higher sloped surfaces that round out the remainder of the scheduled class activities.
  NOTE: *No PARTICIPANT will be allowed to progress to the next greater increment of pitch or height before they have demonstrated competence at this level.*

1:45 pm – 3:15 pm – 9/12, 14/12 & 18/12 Pitch Static Climb and Descent –

- *PARTICIPANTS* are introduced to their first climb, *BELAY TRANSFER*, and descent on a 9/12 to 18/12 pitched composition roofing system utilizing a Petzl "Rig" *DESCENDER.*
- *PARTICIPANTS* will receive instruction on aggressive pitch climbs and given the opportunity to demonstrate comprehension of this information by climbing and descending a 14/12 pitched roof.
- *PARTICIPANTS* will be provided the opportunity to use the information and skills acquired on the 14/12 pitched roofing surface to ascend and descend a 48 ft long 18/12 slope.

3:15 pm – 4:00 pm –Fall Arrestor use Training –

- *PARTICIPANTS* led back to 8/12 element where they will be provided a demonstration on the proper use of a Petzl "Rescuesender" *ROPE GRAB*.
- All *PARTICIPANTS* will be provided the opportunity of utilizing a *ROPE GRAB* as the *PRIMARY BELAY DEVICE* up and over an 8/12 pitched roofing surface.

4:00 pm – 4:30 pm – 360° Pivot Line Training–

- *PARTICIPANTS* provided a demonstration on how to build a pivot point with a primary *LIFELINE* and attach a *SECONDARY LIFELINE* / *PIVOT LINE* for 360° roof inspection access.

4:30 pm – 5:00 pm - Training Day Recap and Review / Course Exam–

- Group review of the day's key learning points utilizing a 40 question exam that highlights the critical components of their Roof Specific Rope Access Training day.

5:00 pm - Sign Out

"Day Two"

7:30 am – 8:00 am – Knot Tying Rewiew –

- *PARTICIPANTS* provided the opportunity to arrive 30 minutes early to work on and improve knot tying skills.

8:00 am – 9:30 am –Skills Testing - *PARTICIPANTS* are required to complete the following skills tests:

Harness Selection and Application Review & Skills Testing

- *PARTICIPANTS* will be provided a review on how to properly select and apply a full *BODY HARNESS* system and then as one group required to get into their harnesses without any further assistance from class instructors. This skills test will be complete when all *PARTICIPANTS* are wearing harness systems in a manner consistent with harness manufacturer's recommendations.

Skills Test # 1
Correct Harness Application
Participant Must be Able to Demonstrate 100% Accuracy
No Time Limit

Knot Tying Skills Testing

- Individual testing event where *PARTICIPANTS* will receive a complete review of all six class knots and then required to re-produce them unassisted with 100% accuracy. Individual testing event where

Skills Test # 2
Re-Create Six Class Knots
Participant Must be Able to Demonstrate 100% Accuracy
5 Minute Timed Event Limit

Lifeline Placement Skills Testing

- *PARTICIPANTS* must demonstrate the ability to utilize *LINE PLACEMENT* tools to set a *LIFELINE* over a two and a half story roof structure.
- *PARTICIPANTS* must demonstrate the ability to appropriately take down and re-stack all *LIFELINE* and *LINE PLACEMENT* cordage after *LIFELINES* have been set.

Skills Test # 3
Lifeline Placement
Participant Must be Able to Demonstrate 100% Accuracy
14 Minute Timed Event Limit

Static Line Set-Up Review & Skills Testing

- All *PARTICIPANTS* will be provided a review on *STATIC BELAY SYSTEM* set-up and use procedure and then required to build a complete static *LIFELINE* consisting of two anchors, two anchor webbings, four three stage carabiners and one low stretch rope.

Skills Test # 4
Set Static Belay
Participant Must be Able to Demonstrate 100% Accuracy
8 Minute Timed Event Limit

12:00 pm – 12:30 pm On-Site Lunch (Provided)

12:30 pm – 4:00 pm Skills Testing Continues –

Ladder Use & High Static Belay Skills Testing

- *PARTICIPANTS* must demonstrate the ability to correctly utilize extension ladders and a full static *BELAY SYSTEM to access and inspect a two and a half story(10/12 & 12/12) roof structure.*

Skills Test # 5	Skills Test # 6
Extension Ladder Set-Up and Use	**Complete High Static Belay Inspection Climb**
Participant Must be Able to Demonstrate 100% Accuracy	**Participant Must be Able to Demonstrate 100% Accuracy**
No Time Limit	**No Time Limit**

Pivot Line Review & Skills Testing

- All *PARTICIPANTS* will be provided a review on *PIVOT LINE* set-up and use procedure and then required to correctly assemble and use a pivot line to access an 11/12 pitched slope that is perpendicular to a *PRIMARY LIFELINE*.

Skills Test # 7

Build and Use a Working Pivot Line Off of a Primary Static Lifeline

Participant Must be Able to Demonstrate 100% Accuracy

No Time Limit

Self-Rescue Instruction, Demonstration & Skills Testing

- *INSTRUCTOR* led discussion on the dangers of long term harness suspension and the most common roof inspection specific scenarios requiring *SELF RESCUE*.
- *PARTICIPANTS* are provided instruction on how to avoid situations requiring *SELF RESCUE*.
- *INSTRUCTOR* demonstration on how to employ safe and effective *SELF RESCUE* techniques in the event of a *LIFELINE* process error or *INCIDENT*.
- *PARTICIPANTS* must demonstrate rational thought / critical use techniques required to complete their own *SELF RESCUE* from true vertical suspension.

Skills Test # 8

Complete Vertical Suspension Self-Rescue Exercise

Participant Must be Able to Demonstrate 100% Accuracy

No Time Limit

4:00 pm – 4:45 pm – Course Review & Written Test–

- *PARTICIPANTS* are provided an oral review of critical skills training provided over the previous fifteen hours of class time.

Written Test

Complete Multiple Choice Exam

Participant Must be Able to Pass with a Score of at Least 70% Correct

No Time Limit

4:45 pm – 5:00 pm - Course evaluations and sign out.

Participants who successfully complete program lessons, practical skills testing and written testing will be provided certificates that document full Level I Technician certification within five business days of class completion.

Definitions

Anchor – a critical component of a Personal Fall Arrest *BELAY SYSTEM* used as a secure point to attach a *LIFELINE* or *LANYARD.*

ANSI - (American National Standards Institute) American Based Committee for Standardization. Professional US organization that establishes standards for a wide ranging variety of products.

Approved – accepted as appropriately sound by duly appointed administrative or regulatory authority.

Ascender – a *BELAY DEVICE* best suited for climbing up a roof slope by gripping a rope when loaded in one direction and sliding freely in the opposite direction when pushed forward. Many ascenders are not suitable for use as a *PRIMARY BELAY DEVICE* due to insufficient working load ratings, and/or their threat for potential damage to the rope that they attach to.

Authorized Person – An individual who has the approval of their employer to perform duties at a location where they will be exposed to high angle fall hazards. *(ANSI Fall Protection Code Definition 2.11)*

Belay – Secure to a *LIFELINE*.

Belay Device – a *CRITICAL COMPONENT* (equipment or hardware) of a *BELAY SYSTEM*. A piece of equipment (ex. *Ascender, Descender , Prussic Cord, Fall Arrestor*) designed to arrest a fall when used in a manner consistent with the manufacturers recommendations.

Belay Transfer – action performed by a *CLIMBER* to re-orient a *BELAY DEVICE* or otherwise secure themselves during the process of transitioning to a separate roofing slope.

Body Harness – A single or multiple piece Nylon based component system of straps that encapsulate both the upper and lower torso and provide a point of attachment for *CONNECTORS* or *BELAY DEVICES*, designed to evenly distribute arresting forces across the chest, shoulders, waist and thighs.

Carabiner – A form of *CONNECTOR* consisting of a complete loop with a spring loaded entry gate.

CE – A mark or logo placed on a piece of equipment by the manufacturer to indicate compliance with the laws and standards for safety, environment and consumer protection established by the European Union (EU).

CEN – European Committee for Standardization. Professional European organization that establishes standards for a wide ranging variety of products.

Climber - an individual completing the process of access ascent, descent or physical assessment of a roofing structure.

Competent Person – an individual designated by the employer to be responsible for the immediate supervision, implementation and monitoring of the employer's managed fall protection program who, through training and knowledge, is capable of identifying, evaluating, and addressing existing and potential fall hazards, and who has the employers authority to take prompt corrective action with regards to such hazards. *(ANSI Fall Protection Code Definition 2.30)*

Connector – a device (ex. carabiners, snap hooks, rapid links) used to combine components of a *FALL PROTECTION* system.

Critical Component – an *ANCHOR*, *BODY HARNESS*, *BELAY DEVICE* or other piece of equipment essential to the creation of a *FALL PROTECTION* system.

Decelerator – a component of a *PERSONAL FALL ARREST SYSTEM* either by design or inherent qualities, capable of reducing the shock load experienced by a person from free fall.

Descender - a *BELAY DEVICE* used to secure a moving climber along / both up and down a *LIFELINE* (ex. Fig Eight or Grigri) best suited for *RAPPELLING* / climbing down a slope as it allows for the controlled descent of a *CLIMBER* with little more than hand pressure and proper technique.

Dynamic Belay / Team Belay **–** a *BELAY SYSTEM* made up of at least two individuals (consisting of a *CLIMBER*, a *GROUND BELAY* person and may include additional people for use as a *PERSONAL ANCHOR* System) all working together as components of a *FALL PROTECTION* system.

Dynamic Rope – Rope which is capable of arresting the free fall of a person engaged in mountaineering or climbing with a limited impact force. (EN 892:97)

Element – a structure designed to simulate roofing surfaces of varying heights and pitch.

Energy Absorber / Shock Absorber **–** a component of a *FALL PROTECTION* system designed to dissipate / limit shock related energy to the human body imposed during the fall arrest process.

Engineered System – equipment and/or hardware designed and created by a *QUALIFIED PERSON* for the purpose of use within a *BELAY SYSTEM*.

Fall Arrester – a *BELAY DEVICE* that moves along a *LIFELINE* and engage / lock onto a *LIFELINE* in the event of a fall.

Fall Factor – A measure of fall severity calculated by dividing the distance fallen by the length of rope used to arrest the fall. (NFPA 1983:2001)

Fall Protection – Any equipment, device or system that prevents an accidental fall from elevation or that mitigates the effect of such a fall. *(ANSI Fall Protection Code Definition 2.67)*

Fixed Anchor – a secure point or combination of *LOAD SHARING* points fixed to the earth or structures capable of sustaining a minimum of 5000 flb of force without failure.

Ground Belay - a *CRITICAL COMPONENT* of a *FALL PROTECTION* system performed by a person or persons controlling a *LIFELINE* connected to a *BELAY DEVICE* , who is attached to a *PERSONAL ANCHOR*, or positioned as a *HUMAN ANCHOR*, to secure a *CLIMBER*.

Hand Line / Secondary Lifeline – an additional line placed next to *PRIMARY LIFELINE* used by a *CLIMBER* to assist in the process of ascending and descending a pitched roof slope in a *DYNAMIC BELAY* process.

Human Anchor – A form of a *WEIGHT BASED ANCHOR* used to secure either a *STATIC BELAY SYSTEM* or a *DYNAMIC BELAY SYSTEM CLIMBER* when both *FIXED ANCHORS* and *PORTABLE ANCHORS* are not otherwise available.

Incident – an unplanned or unintentional occurrence that produces significant threat to personal injury or property damage. Sometimes referred to as a close call or near miss.

Instructor – a *COMPETENT PERSON* who has met all ACRABAT Level II practioner standard requirements for training, experience and supervised instruction.

Jumar – a hand held ascending device used to assist in the process of climbing up a steep slope and are also known for their application as a component of self rescue. Jumars, also referred to as hand held ascenders are not rated by most manufacturers for use as a *PRIMARY BELAY DEVICE* and have very limited application for the act of descending.

Lanyard – a *FALL PROTECTION* system component consisting of a flexible rope, wire rope flat cordage strap or webbing typically utilized to attach a *LIFELINE* or belay harness to a *CONNECTOR*, arrestor, *ENERGY ABSORBER* or *ANCHOR*.

Lifeline - a component of a *FALL PROTECTION* system consisting of rope cordage secured on or over a structure by at least one *ANCHOR* point.

Line Placement – the act of positioning a *LIFELINE* in place across an object or structure.

Line Placement Device – a tool or collection of tools employed from ground level to position a *LIFELINE* in place across an object or structure.

Load Sharing – typically denotes the incorporation of several *ANCHORS* to provide enough foot pounds (LBF) of resisting force to secure a *LIFELINE* within a *FALL PROTECTION* system.

Low Stretch Rope – a rope with a maximum elongation greater than 6% and less than 10% at 10% of its *MINIMUM BREAKING STRENGTH*. (ref. CI 1801-98)

Minimum Tensile / Minimum Breaking Strength – Eighty percent (80%) of *Tensile Strength*.

Newton / Kilonewton– a unit of force listed in the SI system (The International System of Units), which is comparable to pounds of force (lbf) in the US System. 1 kilonewton (kN) = 1000 newtons = 224.8 lbf.

NFPA – The National Fire Protection Association / NFPA is an authoritative source that serves as a leading advocate on public safety. Establishes consensus codes and standards recognized by ANSI.

OSHA – The Occupational Safety and Health Administration. An agency of the United Stated Department of labor created by congress on December 30th 1971 to prevent work-related injuries, illnesses, and occupational fatalities.

Participant – an individual student or trainee taking part in an *INSTRUCTOR* facilitated *FALL PROTECTION* system classroom training or exercise.

Personal Anchor – a point of attachment used to secure a *HUMAN ANCHOR* performing the responsibilities of *GROUND BELAY*.

Personal Fall Arrest System (PFAS) – the assembly of *FALL PROTECTION* system components for the purpose of arresting a person in free fall by which:

1. all gear / components are load rated by the manufacturer and inspected prior to use.
2. all components are rated for a *TENSILE STRENGTH* of at least 5000 LBF / *WORKING LOAD LIMIT* of at least 600 LBFs.
3. all cordage is composed of synthetic fibers.
4. all anchorage points are independent from other anchorage points.
5. all components are assembled in a manner which prevents a CLIMBER from free fall of more than six (6) feet or from contacting a lower level.
6. limit deceleration distance of a CLIMBER in free fall to no more than three and a half feet (3.5' / 42").
7. All *LIFELINE* components subject to impact loading that produces forces in excess of the *WORKING LOAD LIMIT* should be removed from service and not reused until inspected by a *QUALIFIED PERSON* and determined to be suitable for re-employment within a *PERSONAL FALL ARREST SYSTEM.*

Pivot Line / Secondary Lifeline - a component of a *FALL PROTECTION* system consisting of rope cordage attached to a *LIFELINE* / *PRIMARY LIFELINE* that is secured by two anchor points for the purpose of allowing perpendicular movement away from the primary *LIFELINE*.

Primary Belay Device – a *BELAY DEVICE* that serves as the primary means by which a climber is secured to a *LIFELINE*. Primary Belay devices are typically selected based on their overall strength rating as well as their resistance for causing damage to a *LIFELINE* during the process of arresting a *CLIMBER* in free fall.

Primary Lifeline – a *LIFELINE* which is attached to at least one *ANCHOR* within a *FALL PROTECTION* system.

Qualified Person – an individual who, by possession of approved professional standing, recognized degree, extent of knowledge, training and experience in the field of *FALL PROTECTION* and rescue is capable of designing, analyzing, evaluating and specifying *FALL PROTECTION* and Rescue systems to the extent required by these standards. *(ANSI Fall Protection Code Definition 2.129)*

Rappel – the controlled descent down a roofing slope or building structure.

Reasonable Person – a legal term used to describe a rational, reasonably intelligent person, appropriately informed, fair, and conscious of law. This term intended to embody the make up of the "average" person.

Redundancy – a procedure and/or device designed to serve as a fail-safe back up process to all primary components (as determined by a *QUALIFIED PERSON*) of a *FALL PROTECTION* system with a history of failure primarily associated with user error.

Redundant Belay Device – a multi-directional *BELAY DEVICE* that requires no action to re-orient during slope to slope transfers, utilized as a back up to a *PRIMARY BELAY DEVICE*.

Rip Stitch Shock Absorbers – a form of energy absorbers that utilize forty-two inches (42") of stacked / s folded webbing stitched together in a manner that will allow the webbing to rip and unfold in the event of a free fall that produces forces of shock that exceed a designated force (typically nine hundred pounds (900 lb)) situated below the threshold for shock trauma damage to the human body.

Risk Management – is the identification, assessment and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor and control the probability and/or impact of unfortunate events. *(Wikipedia)*

Secondary Lifeline – a *HAND LINE* or *LIFELINE* used in addition to the *PRIMARY LIFELINE* to build *PIVOT LINES* or simply assist / enhance a *CLIMBER'S* mobility on a roof structure.

Self Rescue – the incorporation of equipment and techniques necessary for a *CLIMBER* to regain mobility along a *LIFELINE* following an *INCIDENT*.

Shall – the word "shall" is to be understood as denoting a mandatory requirement.

Shear Reduction - the act of selecting, combining or employing components or naturally occurring elements to reduce the cutting force of belay cordage by increasing the bend radius over which the *BELAY* cordage is subject to.

Should – The word "should" is to be understood as advisory, or a recommendation.

Static Belay / Solo Belay **–**a process of roof inspection utilized by a solo *CLIMBER* in a *FALL PROTECTION* system.

Static Rope – a rope with a maximum elongation of 6% at 10% of its *MINIMUM BREAKING STRENGTH*. (ref. CI 1801-98)

Tensile Strength / Breaking Strength – sometimes referred to as tensile breaking strength represents the amount of load force required to bring material or combination of materials to failure.

UIAA – International Mountaineering and Climbing Federation (formerly known as the Union of International Alpine Associations). UIAA standards are commonly adopted as EN (European Norm) or CEN standards.

Weight Based / Portable Anchor - a secure point of attachment (as determined by a *Qualified Person*) consisting of weight encapsulated / contained / securely attached to by a load rated system of *CONNECTORS* and/or nylon cordage, of equal or greater weight of that of the *CLIMBER*.

Working Load Limit (WLL) – represents the maximum allowable load of a component, system or *BELAY DEVICE* as determined by the manufacturer. Working load limits define the boundaries of force that all load rated PFAS equipment should operate within in order to avoid damage or compromise. The determination of WLL is normally the expression of 15% of *MINIMUM BREAKING STRENGTH* however, should also incorporate consideration