CHAPTER 1

What Is Rope Access?

By the end of this chapter you should understand:

- How rope access differs from controlled descent, bosun's chairs, rope descent systems, and other aspirant rope based systems
- Some distinct benefits offered by rope access
- Some capabilities of rope access technicians
- The historical context of rope access
- How to differentiate rope access from recreational rope systems
- The essential components of a rope access system
- The importance of a sternal attachment for safety
- Some examples of work applications where rope access is used
- How rope access can interface with other methods of fall protection
- How to approach the implementation of a rope access program.

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1-1 INTRODUCTION

Employers around the globe are charged with a complex task of safely managing safety at height in a wide range of activities and industries, and they are expected to do so in a manner that is effective in terms of both safety and fiscal responsibility. At no point in history has this been more critical to the progression of our society than in this post-global recession. Companies and entire industries as a whole are actively working to find new ways to work more efficiently to make more progress with less (workers, money, time, resources, etc.)

Rope access is a specialized mode of access and protection that site owners and managers frequently turn to as a solution when specially trained, certified technicians have to be deployed to hard-to-reach places with maximum safety and minimal cost.

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When workers are engaged in working at height, rope is commonly used as a vertical lifeline to provide fall arrest, thereby preventing catastrophic injury in the event of a fall. Rope access takes this approach to safety one step further, by employing two ropes for the safety of the worker: one rope to support the human load and another independently anchored rope for secondary safety.

The secondary safety used in a rope access system is much more conservative than a typical fall arrest system, limiting both fall distance and transmitted-energy potential to very low levels. Rope access is a method of access that provides the user with the means to safely gain access, be supported, as well as a means of egress from a high place, for the purpose of carrying out work.

The term "rope access" encompasses a fairly broad range of capabilities, but properly used rope access is distinctly unique and stands apart from such concepts known as "controlled descent", "rappelling", "bosun's-chairs", "rope descent techniques" and other colloquial terms that have been at times used to generically describe rope-based methods of working at height.

Rope access is unlike any of these, but is unique in that it provides a complete system of access and safety wherein a properly trained and equipped technician will use a completely interchangeable two-rope system. One rope in the system is designed as the primary or working rope, and the other rope is designated as the backup or safety in the system. In a properly rigged rope access setup, as shown in Figure 1-1, each line is fully capable of serving the role of the other. Specifically, the primary line can be used interchangeably to perform the function of the safety line, and vice versa. This interchangeability is essential to achieve the wide variety of capabilities and depth of safety that is unique to rope access.

In the rope access system, the primary/working rope in the system is used not only to ascend or descend a rope, but also to perform a range of movements including passing intermediate anchors, moving horizontally through a rebelay or rope interchange, performing emergency escape, rescuing a coworker, and more. The backup rope serves as just that – a safety backup in case the primary rope system should become compromised or even fail.

Why Choose Rope Access?

For many trades, rope access provides an excellent solution for gaining access to difficult-to-reach locations. The extensive amount of knowledge and training that rope access technicians possess, and the highly disciplined and structured system that rope access comprises mean that more complex jobs can often be performed more safely and efficiently, in a shorter period of time, resulting in both monetary and safety benefits.

For example, when the Arizona Department of Transportation wanted to remove a bird nest from the underside of a bridge on Interstate 10 near Tucson, the inaccessible location of the nest posed an extraordinary challenge. With no walking surfaces within reach of the nest, access was not easily achievable. A heavy duty bucket truck with an articulating arm, known as a "snooper", was initially believed to be the only possible solution, at an estimated cost of over $22,000. Aside from the extraordinary cost, this option would have required lane closures during the work, and would have put workers at risk, in an exposed location, without any back-up alternative for rescue.

After some deliberation, rope access experts were consulted and a system was designed to position suspended workers within easy reach of the nest with 100% backup safety at all times. As an added bonus, the workers were completely



FIGURE 1-1
Rope access requires two independent, interchangeable systems: one for primary access and the other for backup © vuedici.org/BEAL.

self-sufficient and capable of self-rescue and coworker-assisted rescue in case of an emergency – which of course never became necessary. The work was accomplished in less than 4 hours at a cost of less than $4000.[1]

While other methods are sometimes available for protecting workers at height, rope access is an especially good choice for temporary access to locations that are difficult to reach, where other methods might cause physical damage or interference to the structure, where the installation and use of other methods would be time consuming or overly expensive, and also where speed or versatility is desired.

For some trades rope access methods can help get a job done more quickly, efficiently, and safely, than would be possible using conventional fall protection methods. Because the techniques and equipment are conducive to low-impact methods, work can be performed without damage to historical or fragile environments. Rope access workers also have less time exposure to heights, thereby increasing safety.

To realize these advantages to their fullest, strict adherence to the principles of professional rope access is paramount. Professional rope access requires more than just a person with a rope and a descender. It is a complete system of work, with

[1] Actual example, submitted by Ken Piposar, Abseilon Rope Access; Davidson Canyon Bridge Project; November 2014.

specific requirements for effective management and application from start to finish. Anything less than this is not rope access, and will not result in the monetary and safety benefits that exemplify true rope access.

1-2 FOUNDATION AND EVOLUTION OF ROPE ACCESS

The early foundations of the rope access system may be found in mountaineering and particularly in caving, where methods and techniques were developed over centuries for traversing dangerous terrain and negotiating vertical spaces. However, the equipment and techniques employed by today's rope access technician bear little resemblance to the equipment used for recreational methods. For the purpose of professional work at height, rope access methods and techniques have been adapted to incorporate specially designed equipment rigged into two separate systems, as described above, with one as the primary support and the other as the safety backup. In contrast, recreational pursuits at height generally rely on only one rope system rather than two. In addition, some components of equipment used for recreation are insufficient for rope access and have been modified or replaced to improve safety.

While rope access today still offers practitioners a means to access the most complex and challenging at-height work spaces, the modernization of rope access has resulted in a system that offers an extraordinary level of protection to practitioners, which exceeds typical fall arrest practices. Given the progress in the adaptations of the methods, and the techniques and equipment used for modern rope access, the resultant professional approach bears only very superficial similarities to its recreational predecessors.

The Modern Rope Access System

In a typical modern rope access system, one rope (the "primary" or "access" line) is used for access and egress and for support at the work location. The worker wears a harness, which is in turn connected to the access line with specially designed devices to accommodate movement and provide support on the rope. The other rope (the "backup" or "secondary" line) is also connected to the user's harness, which is in turn connected to a device that is towed up or down along the safety line as the user ascends or descends the working line. In the event of a failure of the working line or any of its components, the safety system will engage to catch the fall and limit the resulting forces on the user and the equipment. In a properly rigged rope access system, such as that shown in Figure 1-2, the fall protection that the backup line affords is completely separate and independent from the primary means of support.

The two individual rope systems in a complete rope access configuration are at once independent yet interchangeable, offering great versatility while maintaining continuous redundancy.

In addition to having been trained in basic maneuvers for moving up and down the rope, competent rope access technicians are also trained in specialized access methods, such as traversing, aid climbing, and even lead climbing, and they are also trained in more conventional fall arrest and restraint methods as well. This breadth and depth of capability is what permits the rope access worker to protect themselves in such a wide range of challenging environments.



FIGURE 1-2
Backup must be completely separate and independent from the primary means of support. Courtesy of Abseilon USA, www.abseilon.com.

Skills Required for Modern Rope Access Workers

The safe use of rope access and associated systems requires a certain amount of competence on the part of the practitioner. Competence requires not just the capability to perform a skill, but also the ability to understand the logic behind the maneuvers, and to take corrective action when something doesn't go as planned. To this end, every rope access technician should thoroughly understand the reasoning behind the actions they are able to perform. In addition, rope access technicians must be capable of getting themselves out of any predicament they might get themselves into. This requires a range of skills. For example, a technician who can descend must also be capable of ascending; a technician who can pass a knot on ascent must be capable of passing a knot on descent; a technician who can negotiate a deviation in one direction must also be able to negotiate it in the other. Finally, a rope access technician must be capable of performing coworker-assisted rescue in the event that a workmate becomes incapacitated. These techniques, and more, will be addressed in this book.

Gone are the days when just being a climber, or just knowing how to rappel, was sufficient for a rope-based job. The drive toward greater safety and protection for the worker demands competence at a much higher level. Such competence is best acquired through expert training and experience, and should always be confirmed through independent assessment and certification by an appropriate certifying body. The quality of a certifying body will, at least to some extent, dictate the quality of the technicians they endorse.

1-3 ROPE ACCESS COMPARED/CONTRASTED WITH OTHER DISCIPLINES

Rope Access Contrasted with Recreational Rappelling

Some readers may more readily recognize the reference to rope descent by its recreational counterpart, rappelling. This term is used to describe the method commonly used by climbers and cavers to lower themselves from a high point to a low point during mountain climbing or caving activities.

To rappel, rappellers select an anchor (or sometimes two), attach their rope to it, place a rappel device on the rope, attach it to their harness with a carabiner, and back over the edge, as shown in Figure 1-3.

To the casual observer, this concept may seem pretty similar to the method a rope access technician uses to descend rope. However, a close examination and comparison of the equipment and how it is rigged in Figure 1-1, as compared with Figure 1-3, can be enlightening.

Although rope access descent is addressed in detail in Chapter 10, it is imperative here to understand the notable and distinct differences that set professional rope access equipment and methods apart from recreational rappelling.



FIGURE 1-3
A typical recreational rappelling system. Courtesy of Jay Smith.

Foundationally, the first difference is in the rope itself. Rope access technicians select a rope that meets appropriate industry standards, and is rated to a minimum strength of at least 6000 lbf. The rope access rope typically offers very low elongation as compared with the rope most often selected by climbers. This rope is terminated with manufactured terminations (such as sewn or swaged ends) or is "field terminated" by the user using accepted knots that will not reduce the strength of the rope beneath 5000 lbf – a concept explored in more detail in Chapter 7. There is no such requirement for recreational rappelling equipment, and the performance properties of rope used for recreational rappelling may vary widely from that used for rope access.

This differentiation extends to other components of equipment as well. The rope access technician will use locking connectors designed for professional use, whereas the recreational user may use a variety of equipment with performance requirements that are more suited to recreational use. You can read more about equipment for rope access in Chapters 4 and 5.

Perhaps the greatest distinctions between rope access descent techniques and recreational rappelling are specific to the methods used. Specifically, a single rope typically comprises the recreational rappeller's only connection to terra firma. Sometimes called "single rope technique" (SRT), this approach may be appropriate for a recreational climber or caver, but not normally for rope access. The rope access technician is more likely to use two such ropes, as described previously and as shown in Figure 1-1, one as a primary system and the other as backup.

Rope Access Contrasted with Controlled Descent

"Controlled Descent" is a term that evolved into use, primarily by certain industries and related regulatory bodies, to describe the concept of a worker using a recreational rappelling type system as described in the previous section, with conventional fall protection methods (described later in this chapter) as backup. An example of such a system is shown in Figure 1-4. These methods were introduced by window cleaners, chimney sweeps, and others – many of whom were recreational climbers or cavers themselves – who understood the advantages offered by rappelling, and realized that by adding a conventional fall protection system they could be compliant with the regulatory requirements.

While arguably "compliant", there are some distinct concerns with this approach. First and foremost is the fact that the two systems are completely dissimilar and are not designed to function harmoniously with one another. For example, harnesses used for fall arrest are generally designed in an H configuration (Figure 1-5a) and most often offer only a dorsal attachment, whereas harnesses used for rope descent (Figure 1-5b) are designed to hold the wearer in a seated position with a sternal or waist attachment. One outcome of these differences is the fact that the system used for controlled descent is not generally conducive to permitting the worker to ascend out of whatever circumstance he might find himself in.

In addition, the ropes historically used for conventional fall arrest differ from those used for rope access. Fall arrest ropes are most often of a laid variety and incorporate fall arresters that are not easily manipulated on and off the rope, whereas ropes used for rope access are of a kernmantle design and make use of backup devices that accommodate ready transition and transfer. The differences abound, but are subtle and primarily rooted in functionality, and therefore the casual observer may not readily perceive the differences.

From a safety perspective, however, the distinctions are notable in that the controlled descent approach does not accommodate the very versatility that is



FIGURE 1-4
A typical controlled descent system.

foundational to safety in rope access. Specifically, the controlled-descent type system is not friendly to ascending, nor is it conducive to making transitions such as knot passes, rope-to-rope transfers, rebelays, direction changes, and so on, and it does not facilitate safety and simplicity for coworker-assisted rescue.

When workers fall into their backup system while using controlled descent methods, they are left suspended from whichever conventional fall protection attachment they are using. While in some cases this may be a sternal attachment, the dorsal attachment is arguably a more common point of attachment for conventional fall protection. A worker suspended from this point after a fall, as shown in Figure 1-6 is left without any means of escape. While it is possible to extricate oneself or another from a fall arrest system (McCurley, 2013) the fact remains that the methods for this must be learned, and generally require special training and equipment.

Another essential safety consideration is that there is no specified universal training requirement or certification format for controlled descent; typically, these methods are simply employed by people who are familiar with the techniques from using them recreationally. Worker training for conventional fall arrest, which typically consists of only up to around 10 hours of broad instruction that does not necessarily include practice for rescuing oneself or workmates, also does not normally address these methods. Contrast this with rope access training, which



(a) (b)

FIGURE 1-5
(a) fall arrest harness (b) rope access harness. Courtesy of EDELWEISS SAS.

typically involves at least 40 hours of specific instruction in rope access methods and techniques, including rescue methods, just to authorize a technician to work under the specific direction of a more competent technician.

Rope Access Contrasted with Rope Descent Techniques

In recent years, the term "rope descent techniques" (RDS) has been tossed about in lieu of the term "controlled descent" but there appears to be little or no practical difference between the systems generally described by these two terms.

Rope Access Contrasted with Bosun's Chairs

The concept of the bosun's chair originated at sea, with the proper term being "Boatswain's Chair". A boatswain is the seafaring moniker for a warrant officer



FIGURE 1-6
Worker suspended in conventional fall arrest. Vertical Rescue Solutions by PMI.

who is responsible for operations on deck. In the case of sailing ships, part of a boatswain's responsibilities consists of maintenance and rigging of the sails. The boatswain's chair (bosun's chair), then, consisted of a wooden plank rigged with stout lines to form a seat, which was then suspended from the mast and raised and lowered by means of an integrated block and tackle, as shown in Figure 1-7. This was used to haul a sailor up the mast on a halyard to do repair work or inspect the rigging.

Humans, being the ingenious creatures that they are, adapted the concept of the seafaring bosun's chair to other types of work at height, particularly in coastal regions where sailors sought ways of plying their skills and earning a living ashore. The bosun's chair was quickly perceived by window cleaners, chimney sweeps, and even construction workers to be more secure, and at times more versatile, than a ladder, especially where a worker needed to spend extended time at height.

Today's version of a bosun's chair system has evolved to include greater emphasis on comfort, weight, and strength, and may also feature a body support strap or straps to help prevent the user from slipping out, as shown in Figure 1-8. These systems are typically used and regulated as suspended scaffolds, and should not be confused with rope access techniques.

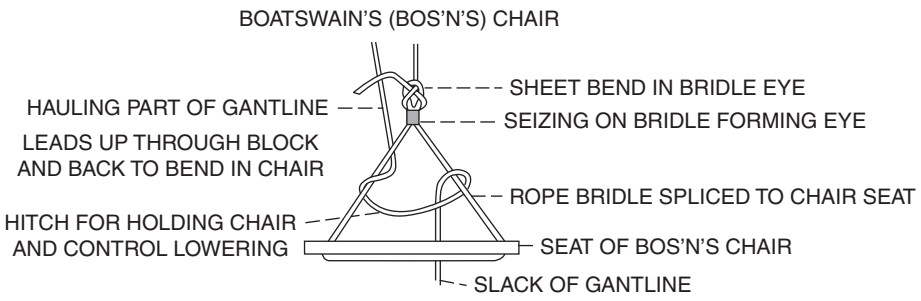


FIGURE 1-7
Classic bosun's chair. National Archives and Naval Historical Ships Association.



FIGURE 1-8
Modern bosun's chair. Courtesy of Tractel.



FIGURE 1-9
Rope access technician with comfort seat. Vertical Rescue Solutions by Pigeon Mountain Industries, Inc.

To be clear, some rope access technicians use a comfort seat that may, to the uninitiated, be confused with the concept of a bosun's chair. However, there are some distinct differences between the two. The rope access system incorporates dual, redundant, interchangeable rope systems, whereas the bosun's chair provides only the access component. The means of backup in a bosun's chair is typically some sort of vertical lifeline system, or self-retracting lanyard. In a rope access system, the worker's harness is directly connected to the suspension system, so that they cannot inadvertently "fall out" or become detached, while in a bosun's chair system it is typically the chair (rather than the harness) that is rigged to function as a single-point suspended scaffold and serve as the primary point of suspension for a worker. The comfort seat used by rope access technicians, as shown in Figure 1-9, is not a part of the life safety system.

Rope Access Backup Contrasted with Other Backup Systems

The compatibility of any backup system's ability to integrate with the primary system is essential. Rope access is particularly unique in that it provides BOTH the means of access and the means of height safety. In other systems, the means of access tends to be distinctly unique and separate from the means of safety. For example, a worker climbing a fixed ladder may be protected by a vertical lifeline; an inspector on a building façade may be protected by a fall arrest lanyard; a machine operator atop a hopper may be protected by a guardrail; an individual ascending stairs may be protected by a handrail; a construction worker may be protected by a safety net; and so on.

Building on this concept, then, a person who is rappelling but using a self-retracting lanyard (SRL) for backup is not using a rope access system; in this case, the descent line might be said to be a positioning system, and the SRL would simply be fall arrest. The fact that the two lines are not interchangeable, that the practitioner is not able to pass knots or deviations using these components, and that the duality required for coworker-assisted rescue is missing, disqualifies the system as a true "Rope Access System."

Where Modern Rope Access Has Landed – The Bus You Take to Work

Rope access is not, by itself, a viable trade. The value of a rope access technician being able to access, work at, and egress a worksite is only useful inasmuch as the work they are able to accomplish at that work location. Glazers use rope access to reach locations where they repair and install glass; engineers use rope access to reach locations where they inspect buildings, bridges, and other structures; wind turbine technicians use rope access to reach locations where they inspect and repair wind turbines; entertainment riggers use rope access to reach locations where they rig and perform stunts and set-work; oil rig workers use rope access to reach locations where they maintain offshore facilities; window cleaners use rope access to reach locations where they clean windows on very tall buildings; rock scalers use rope access to reach locations where they mitigate roadway hazards; and the list goes on.

The act of rope access, then, is useful in that it permits a tradesman to get to a given location where they can apply their trade. With this in mind, rope access is best thought of not as a trade, but simply as a means of access. In essence, rope access can be said to be "*like the bus you take to work*." The term does not describe the work itself, only the means of accessing the worksite.

1-4 COMPATIBILITY AND WORK SAFETY

The compatibility of rope access with other methods of protection must be given due consideration in planning any work. Different countries and jurisdictions may have varying degrees of regulation that can be applied to rope access but, as a general guide, International Standard ISO 22846 provides an excellent framework for the specification and execution of rope access as a work practice. This practice can be used in harmony with other means of access and safety protection, with the worker transitioning between using rope access methods, positioning, fall arrest, and others.

To ensure that a rope access system operates correctly, the employer must adequately plan and manage the work, ensure competency and supervision of workers, provide appropriate equipment, and effectively organize working methods so that the worker is adequately protected at all times.

Rope access methods are often combined with conventional fall protection methods (restraint, positioning, arrest) to accomplish engineering inspections, maintenance work, installations, and other tasks in an efficient and comprehensive manner. The initial training for an entry-level rope access technician may be in the neighborhood of 40 hours, while advanced certification requires extensive experience and verification of greater skill levels. Such extensive training and skills help ensure the ability of the workers to effectively interweave their use of rope access systems with other conventional means of protection.

Fall Restraint

Rope access technicians may at sometimes use Fall Restraint methods once they reach their place of work. A Fall Restraint system will typically incorporate a safety belt or harness, a lifeline or lanyard, and an anchor, which are used together to prevent the worker from reaching an edge where fall potential might exist.

Restraint systems are most often used in an environment where temporary work is being performed, and where the exposure, equipment, and training necessary for a full-blown fall arrest system are simply not justified. A key requirement of a restraint system is that the worker's center of gravity does not reach fall potential.

While restraint systems are often used by workers with considerably less training than rope access technicians are likely to possess, this type of system may also sometimes be useful to trained rope access technicians who have reached a work location via rope access methods, and simply want to remove themselves from any fall potential. In this case, the technicians may connect themselves to the restraint system and then (as long as all fall potential is mitigated) remove themselves from their working line and backup line, or they may elect to leave their backup safety (and possibly even working line) connected to them while simultaneously engaging the restraint system.

Fall Arrest

Fall arrest is a conventional approach to protecting a worker who is at a place of work where fall potential exists. The term Fall arrest does not describe a method of access, but refers only to the system used for secondary protection. These methods are typically used when the worker's feet comprise the means of access, such as when they are walking a beam, climbing a ladder, or standing on a platform.



FIGURE 1-10
Fall arrest. Courtesy of Reliance Industries, LLC.

Use of personal fall arrest systems should only be considered where better protection is not reasonably available. Normally a fall arrest system, illustrated in Figure 1-10, will consist of an anchorage, lanyard, force absorber, connectors, and a full body harness. Additional components, such as a rope, a fall arrester, and other equipment, may be incorporated into some systems.

While personal fall arrest systems are perhaps the most common means of protecting workers at height, they are arguably not the best choice for protection. In practice, users of these systems are potentially exposed to significant free fall, high arrest forces, and have the potential for striking obstructions before or during the arrest phase of the fall. Depending on the jurisdiction, the maximum allowable arresting force on the worker ranges from 1800 lbf (8 kN) to 900 lbf (4 kN).

Fall arrest systems come in many forms, ranging from a simple force-absorbing lanyard to vertical lifelines to self-retracting lanyards to horizontal lifelines to ladder climbs, and more. Due to the complexity of calculating potential loads, forces, strengths, and consequences of a fall, the design and approval of such systems often necessarily require extensive knowledge and experience of a qualified person. Authorized users of conventional fall arrest systems are not necessarily required to possess extensive training or experience; however, the systems specified by qualified persons generally employ equipment and methods that are neither versatile nor interchangeable.

Most rope access technicians will strive to avoid using conventional fall arrest systems, and instead favor the limited fall potential and greater comfort, security, and versatility of a rope access backup system.

Fall Containment Systems

It is rare for rope access systems to be used in conjunction with a fall containment system. The term containment system refers to passive fall arrest techniques such as safety nets that actually permit a fall to occur, but are designed to catch the worker before any catastrophic impact. Again, this term does not describe a means of access, but only the means of secondary protection. Most commonly found in bridge work and steel erection projects, where other methods of protection are not possible, safety nets may be rigged as much as 30 ft beneath the working surface.

Because rope access is primarily used as a robust alternative to infeasibility, nowadays it is not unusual to find rope access solutions in places where fall containment systems may have previously been used.

Suspended Scaffolds

The term suspended scaffold refers to any of a number of types of platforms suspended by ropes, or other nonrigid means, from an overhead structure. The most common type of suspended scaffold features a two-point adjustable suspension system and is commonly referred to as a Swing Stage, an example of which is shown in Figure 1-11. It is common to combine rope access methods with the use of this or other types of suspended scaffold during building maintenance work, bridge inspection and maintenance, wind turbine work, and in other environments.

Some means of backup safety must be used when working on a suspended scaffold. Typically, suspended scaffold workers will use conventional fall arrest for this purpose. When using rope access in conjunction with suspended scaffolds, it may be appropriate to temporarily use the rope access backup system as backup safety while on the scaffold, as long as the limitations of the rope access backup system are not exceeded.

In any case, the worker's backup system should be secured to an appropriate anchorage that is separate from the scaffold system.

Aerial Platforms and Man Baskets

Another solution that is frequently implemented where other means of access and protection are infeasible are aerial platforms and man baskets, such as that shown



FIGURE 1-11
Workers using two-point suspended scaffold.



FIGURE 1-12
Workers using aerial platform. Courtesy of Reliance Industries, LLC.

in Figure 1-12. When there is no surface from which a worker can perform a task, aerial baskets, bucket trucks, scissor lifts, snoopers, and cherry pickers may be used to temporarily raise a worker to an elevated position to accomplish that task.

Note that aerial platforms and man baskets are a means of access; secondary protection is generally provided to the worker by means of a handrail or conventional fall arrest system.

It is common to find rope access methods employed harmoniously with mechanical lifts such as these. Especially in complex environments where an extensive duration of work is combined with the need to reach elusive nooks and crannies, aerial lifts can provide an excellent platform from which to set anchors and serve as a work-base for rope access technicians to further access more remote areas. One example of this would be to perform work or inspection on the underside of bridges.

1-5 SPECIAL TECHNIQUES

There are some special techniques in which rope access technicians are trained but which do not meet the strictest definition of rope access; there being the presence of a primary line for ascending and descending, and there being an equal and interchangeable line for backup safety. The most notable of these are lead climbing and aid climbing, so by way of introduction those concepts will be outlined here. These and other advanced techniques will also be covered in further detail in Chapter 11.

Aid Climbing

In some cases, a work location may not be conducive to installation of a fixed rope; in such cases, aid climbing may be a viable solution. This method, illustrated in Figure 1-13 and further described in Chapter 11, involves the practice of progressing from one anchor to another by the continuous placement of slings and footloops, into which the technician clips lanyards for protection and places their feet into for progression.

A properly trained rope access technician will never have less than two points of attachment at any given time, and potential for a fall is mitigated to less than 2 ft.



FIGURE 1-13
Aid climbing. Courtesy of Abseilon USA, www.abseilon.com.

Lead Climbing

Where a worker must access a structure from below or from a parallel position, without the advantage of a preset anchorage or lifeline from above for protection, lead climbing may be an appropriate technique. Lead climbing involves the placement of anchorage protection and continuous attachment to that protection while climbing a structure. Lead climbing techniques may also be used to protect leading edge work.

Of all the methods used by rope access technicians, this one offers the highest fall potential, so it is only used when absolutely necessary. Specific techniques for lead climbing are discussed in Chapter 11.

1-6 PRACTICAL APPLICATION OF ROPE ACCESS

Responsible employers around the world use rope access methods and techniques that have been implemented by certified and competent technicians; these methods have helped to ensure 100% protection in some of the most difficult to reach locations and in some of the harshest environments, such as the one shown in Figure 1-14.

Rope access has been used to inspect the dome of the US Capitol Building in Washington DC, to pressure-wash the outside of the 605 foot Space Needle in Seattle, Washington, and to clean the glass on the under-side of the Grand Canyon Skywalk, some 4000 ft above the canyon floor. Rope access is commonly used in hot, cold, windy, and even icy conditions, ranging from chilly places as far north as the Arctic to the sweltering sites on the Equator, with equal safety and security.

The cost of implementing a rope access program in a given organization will vary depending on a number of factors. Basic training and personal equipment for one technician, including certification fees, can be estimated at approximately $3500. A minimum of two technicians within an organization should be trained as a starting point – although a team of 6–8 is really recommended for an organization



FIGURE 1-14
Rope access system accommodates safety in hard-to-reach places. Courtesy of Abseilon USA, www.abseilon.com.

that is doing any significant amount of work. A basic complement of rigging gear, including ropes, connectors, and anchorage equipment, can run in the $5000 range, bringing the initial personnel and equipment investment to a minimum of around $15,000 for a team of two.

Because supervision of rope access jobsites is a specialized skill, it is common for organizations to outsource jobsite supervision at first, until staff technicians are sufficiently experienced and certified to perform this task. However, it is safe to say that a basic, simple rope access program can be put into effect for around $15,000. Provision for retraining and equipment replacement should be scheduled on at least a 3-year rotating basis, although specific requirements will vary.

1-7 SUMMARY

The application of rope access methods is most appropriately engaged as a complete system of work in which the following are present and carry equal importance:

- adherence to an accepted rope access plan;
- employment of only competent and certified technicians; and
- exclusive use of equipment that is purpose-designed for rope access.

This text is intended for use by all persons concerned with the use of rope access, including technicians, managers, safety directors, supervisors, employers, trainers, clients, and regulatory personnel.