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Inside

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Working at Heights

The phrase "working at heights" may bring to mind an architectural conservator performing a conditions assessment from a swing stage on a skyscraper, or a paintings conservator treating a wall mural from a pipe frame scaffold, or even a textile conservator inspecting a tapestry in its display setting from a scissor lift. While these are indeed all cases in which the conservator is working at heights, there are much more common situations in which the conservator may find himself/herself, such as when working from a ladder or on the roof of a building with a low parapet. Any time a conservator is in a position or location where a fall has the potential to cause personal injury, he/she is working at heights and should take appropriate precautions to minimize the risk of harm.

Conservation involves two interacting parts: the conservator and the object, used here in the broadest sense of the word to include buildings and sites. In order to carry out his/her work, the conservator must have hands-on or at least close-range access to the object. In the case of small, movable objects, the most common means of access is to bring the object to the conservator. However, this cannot always be done, particularly with buildings and sites, so the conservator must employ equipment to get to the object. There are often several different means available to get to a particular location on a building or difficult to access object, including ladders, pipe-frame scaffolds, hanging platforms, aerial platforms, and rope access. Although each of these methods of access has its own set of conditions and factors that must be understood for safe use, there are also some general rules of safety that apply to any situation in which the conservator is working at heights.

Prior to performing any work at height, there are several steps that a conservator can take to create a safe working environment. First, the conservator should be aware of the surroundings and his/her position in them. Secondly, the conservator should create a safe, controllable work environment. Finally, the conservator should be familiar with the equipment in use when working at heights. By practicing these three precepts of safety, the conservator will have a greater level of comfort and the inherent dangers and risks will be minimized. This article briefly discusses these three rules of safety and then broadly covers the range of equipment used by conservators to work at heights.

Awareness of the work environment means paying attention to detail so that if something changes, the conservator can assess the change and make any necessary compensation. It is more critical that the conservator at height be able to quickly examine and assess a situation compared to working on the ground because the consequences when working at height are potentially much more serious. Paying attention to detail and being aware of the surroundings will also help the conservator to understand more objectively what is safe and what might not be safe when working at heights. By being aware of the surroundings, the conservator will understand his/her place in it and be more comfortable.

The conservator working at heights should be mindful and pay attention to details of the surroundings, and take an active role in creating a safe work environment. First, by establishing and controlling the work zone the conservator can mini-

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mize risks and unknown conditions. The immediate area where the work is to be performed should be cordoned off to prevent people from inadvertently entering the work area. If it is not feasible to completely close off an area to the public, some method of protecting the public must be put in place, such as a canopy over a sidewalk below the work area. Tools and small equipment used by the conservator should be tethered to control the risks of falling objects. When working outside, one cannot control the weather but one can control when the work is done. Work at heights should be avoided during inclement weather including rain, snow, thunderstorms, excessive wind, or extreme cold. The greater control that one can exert over their environment, the greater the comfort level.

Because working at heights requires the use of specialized equipment to get to the object, knowledge of the equipment is essential to safe practice. The conservator should be trained in the use of the particular type of equipment employed and should know the limitations of the equipment. Some jurisdictions may require third party training and certification to operate or work with certain types of equipment. Proper inspection and maintenance of the equipment is also vital to the safe use of access equipment. Routine inspection and maintenance work should be performed by those qualified to use this equipment. In addition, the access equipment should be inspected before every use by the person using it. The equipment becomes an extension of the person using it, so the conservator should feel as comfortable with the equipment as he/she does with him/herself. To work safely at heights, the conservator must understand why he/she is safe.

In situations where working at heights is necessary to perform conservation work, the risk of injury can be minimized by selecting equipment that is most appropriate to the project. There are several means of access employed for working at heights: ladders, scaffolds, aerial lifts, and rope access are all used by conservators. Because each of these methods of access are borrowed from construction and industry, a useful document in understanding the regulations that govern their safe use is Part 1926 "Safety and Health Regulations for Construction" of the Occupational Safety and Health Administration's (OSHA) Standard 29 CFR, commonly referred to as OSHA standards (http://www.osha.gov/doc/index.html). OSHA standards have been adopted whole or in part by 26 states and territories.

The most common piece of equipment used by the greatest number of conservators when working at heights is the ladder. However, there are many different types of ladders, ranging from portable stepladders to fixed ladders scores of feet high. The user must be careful to make sure that the ladder being employed is appropriate to the use and that the correct safety measures for the specific ladder are being followed. The Occupational Safety and Health Administration (OSHA) publication No. 3124-12R "Stairways and Ladders: A Guide to OSHA Rules" describes the different types of ladders and stairways that may be used in conservation work and the rules that apply to their use (http://www.osha.gov/Publications/osha3124.pdf or http://www.osha.gov/Publications/ladders/osha3124.html). For instance, one of the most commonly ignored rules that applies to all types of ladders is that all ladders should be secured in place to avoid accidental movement.

Another means of accessing high areas for conservation work is scaffolding. Standard 1926.450 in OSHA Subpart L, "Scaffolds," of Part Number 1926, "Safety and Health Regulations for Construction," defines scaffold as "any temporary elevated platform (supported or suspended) and its supporting structure (including points of anchorage), used for supporting employees or materials or both" (http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10751). This includes small mobile frame scaffolds on casters, sometimes called "baker" or "painter" scaffolds, and pipe-frame scaffolds built around large structures as well as scaffold platforms suspended from building cornices or ceilings commonly called swing stages or hanging scaffolds. Although the conservator may not be directly involved with the design and construction of the scaffold system, he/she should be familiar with the required safety features and rules that apply to the particular scaffold in use. There are very specific OSHA regulations covering the use of guardrails, planking, support frames, tie-backs, and other parts of the scaffold that the conservator walking on a scaffold should be familiar with to be able to determine if that particular scaffold is compliant.

Subpart L, "Scaffolds," of Regulation 1926 on "Safety and Health Regulations for Construction," also covers the use and operation of aerial lifts, of which there are several different types and many different sizes. The aerial lift may be an extending boom platform, articulating boom platform or vertical scissor lift; it may rest on four wheels or outriggers that must be engaged to operate the lift; and it may be powered by diesel, propane, 110 volt or DC electric batteries.

Other means of reaching difficult-to-access locations that are less common but occasionally used for conservation purposes are industrial rope access and building cranes with man baskets. Industrial rope access systems rely on double rope techniques to safely gain access to a variety of structures. Ropes are anchored to structural members of a building or monument and the workers descend on two fixed lines to perform the investigation. In general terms, technicians are suspended on one rope termed the "working line" with a redundant "fall protection" line used as backup. Hands-off descent control and fall protection devices are integrated into site-specific rigging systems, along with industry-specific climbing and suspension harnesses. Cranes typically used in the construction of buildings can also be used for the inspection or investigation of a structure where other methods of access are not effective. However, the use of cranes for conservation is rare because of their logistical requirements and great expense.

Whatever method of access are used, OSHA requires that fall protection be in place when working at heights greater than six feet from the

ground. Fall protection may be part of the building or scaffold system, such as guard rails or safety nets, or a personal fall arrest system that is attached directly to the worker. These systems are described in OSHA Subpart M, "Fall Protection," Section 1926.502 "Fall Protection Systems Criteria and Practices" (http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10758).

No matter what the equipment or means of access, training is the most valuable tool available when working at heights. Paraphrasing OSHA Section 1926.454(a), training should cover at least the following items: the nature of any electrical hazards, fall hazards and falling object hazards in the work area; the correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being used; the proper use of the scaffold (or other access equipment) and the proper handling of materials on the scaffold (or other access equipment); and the maximum intended load and the load-carrying capacities of the scaffolds (or other access equipment) used. In most areas, general safety training as well as training specific to certain types of equipment is offered by government agencies, private vendors and third parties, such as industry groups. Training that increases awareness of the potential hazards helps to minimize the risks intrinsic to working at heights.

Fear of heights, or acrophobia, is a common and sometimes necessary reaction. It is also useful for the conservator to have some degree of acrophobia when working at heights because it forces one to understand why something may or may not be safe. By definition, there are hazards involved with working at heights. These hazards, and the fear of working at heights, can be minimized by being aware of the surroundings, controlling the work environment and understanding the equipment used to perform the work.

—Evan Kopelson

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Worth Noting

New Visible Conservation Center

The July 1 reopening of the Smithsonian American Art Museum and the National Portrait Gallery after a six year renovation is bringing opportunities for increased public attention to issues facing America's collections. The new Lunder Conservation Center is the first art conservation facility that allows the public permanent behind-the-scenes access to the preservation work of the museums. Conservation staff for both museums are visible to the public through floor-to-ceiling glass walls that allow visitors to see firsthand all the techniques that conservators use to examine, treat, and preserve artworks. The center has five state-of-the-art laboratories and studios equipped to treat paintings, prints, drawings, photographs, sculptures, folk art objects, contemporary crafts, decorative arts, and frames. In addition to providing expanded space for conservation projects, the center is a destination for learning about conservation science and techniques through educational kiosks, videos, public programs, and outreach initiatives. More than 35 conservators from across the country participated in creating these educational components. A 40-foot media wall in the center features interviews with many of these experts.

Paintings and Objects conservation labs open for public viewing. Photos courtesy of the Lunder Conservation Center, taken by Carl C. Hansen.