PROCEEDINGS

Roof Anchors for Façade Access – A General Overview

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Addressing the Building Envelope

ABSTRACT

Building façade access is required for window washing, inspection, maintenance, and repairs. Top-down suspended equipment is often the most appropriate access method for a variety of reasons. Equipment used for building façade access and personnel performing the work are required to be anchored to the building in some form for safety. This presentation will discuss the design, installation, and periodic inspection and testing of roof anchorages for façade access on existing buildings.

SPEAKER

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GREGGREY G. COHEN has been with Simpson Gumpertz & Heger Inc. (SGH) for 23 years and has designed such notable structures as University Hospitals of Cleveland's Mather Pavilion and Lerner Tower; LeLacheur Baseball Stadium in Lowell, MA; Richmond County Ballpark in Staten Island, NY; and renovations and additions to Swedish American Hospital in Rockford, IL. He has extensive experience managing projects involving structural and building envelope investigation, rehabilitation, strengthening and stabilization, demolition sequencing, and cost estimating. He has evaluated many buildings for façade access equipment as part of inspection and repair projects. Cohen has also designed roof anchors for façade access.

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Roof Anchors for Façade Access – A General Overview

PURPOSE OF FAÇADE ACCESS ANCHORS

When access to a building façade is necessary for maintenance or construction, the workers must be provided with safe access to the work. Roof-level anchors are an important component to safety. There are regulations and standards that apply to the anchors that allow safe access to a façade:

1. Personal fall-arrest or lifeline anchorages are used to support workers if they fall from a scaffold or if the scaffold support system fails. These are primary systems that will suspend a worker in the air after an equipment failure until an emergency response team can complete a rescue.
2. Equipment anchorages, also called "tie-downs," are used to support each end of suspended scaffold in the event of an equipment failure. These are secondary systems that keep the equipment from falling from the building in the event of a failure.

Anchors used for personal fall arrest or equipment must be designed, inspected, and tested in conformance with OSHA regulations and IWCA standard.

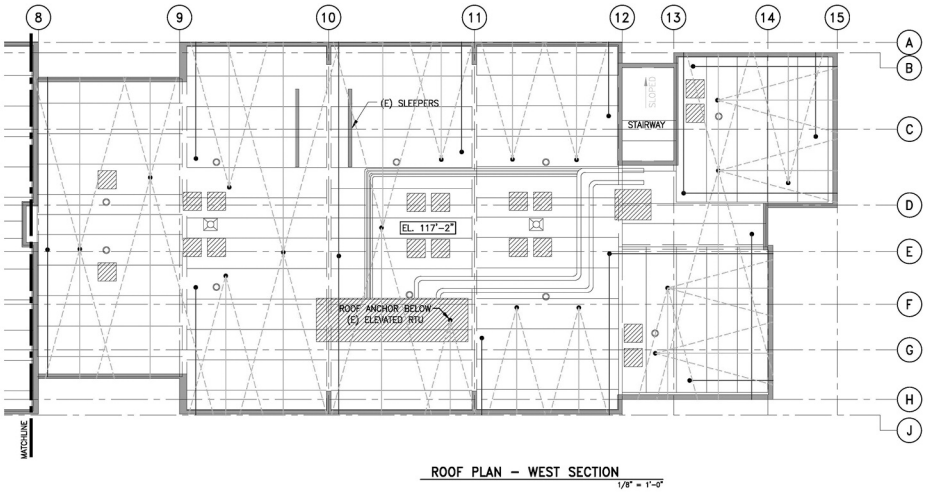

Figure 1

INTRODUCTION: WHY ANCHORS ARE NECESSARY

Access to building façades is required for periodic maintenance such as window washing, reglazing, or caulking, and for construction activities such as masonry repair, concrete repair, and component replacement. The use of suspended work platforms supported from cables and tied to anchorages on the roof is a frequently used method of providing worker access to building façades (*Photo 1*) for construction and maintenance. The use of boatswain chairs supported from two independent suspension ropes is a frequently used method of providing worker access to building façades for window-washing maintenance. All employees performing work from these systems must use anchored personal fall-protection systems. This paper presents a general overview of the structural design, evaluation, and testing of anchorages for fall-protection systems.

There are many forms of suspended scaffolding systems used by contractors, all of which must comply with the anchorage requirements governed by the Occupational Safety & Health Administration (OSHA, a federal agency within the Department of Labor that is responsible for policing worker safety) and, in part, by the International Window Cleaning Association (IWCA, a private, nonprofit organization that primarily

Photo 1

Photo 2

Photo 3

represents building owners and property managers). Suspended scaffolding and each worker using it must be anchored to the building for safety.

Tieback anchors take many forms, including parapet hooks, rooftop mechanical equipment frames, cable wraps, and permanent roof and wall anchors, among others.

Suspended scaffolding systems sometimes are supported by permanently installed equipment, such as davit arms (*Photo 2*), which are supported in davit bases permanently mounted to the roof structure. Alternatively, they may be supported by a temporary assembly consisting of outrigger beams with counterweights, supported by temporary scaffolding systems mounted on the roof (*Photo 3*).

DIFFERENT TYPES OF ANCHORAGES

There are a variety of anchorage types commonly used to support equipment during operation and to arrest falling equipment and workers. Separate anchorages are required for arresting the fall of the equipment and for each worker, all of which must be engineered to meet the structural requirements of OSHA and IWCA. Anchorages that rely on existing building components require special consideration and attention in order to provide the required safety contemplated by OSHA and IWCA.

, including variants called parapet clamps or cornice hooks (*Photo 4*). Parapet hooks rely on existing façade elements for resisting the required anchorage loads from the equipment and workers. This anchorage type typically loads the original parapet construction in a direction and with a force that was considered in the original design. Typically, parapets are designed for gravity loading, uniform wind, and seismic loading only. The parapet clamp will typically load the parapet in a direction and with more force than considered in the original design. The parapet and its attachment to the building structure must be adequate to safely support the anchorage load in the parapet hook. Often, building drawings do not show the configuration of the parapet and its connection to the building structure in enough detail to properly assess their ability to serve as safe anchorage. In this event, a detailed field investigation is necessary to determine the parapet construction in enough detail to make such an assessment. A structural analysis may also be necessary to confirm that the parapet is capable of supporting the required anchor loads. If parapet structures are significantly deteriorated, the impact of the deterioration must be considered in their evaluation. Because they are simple to install, contractors often desire to use parapet hooks; however, they should not be used without confirmation that the parapet can safely support the anchorage loads.

, such as rooftop-equipment steel platforms (*Photo 5*) or equipment screen framing, are often candidates for anchorages. Evaluation of the structural adequacy of the rooftop equipment proposed for an anchorage point should be considered. Just as with parapets, such components and their attachment to the structure must be adequate to safely carry the anchorage load. Review of existing structural drawings will help with confirmation of member sizes and originally proposed connection details. Field investigation may be necessary to confirm member sizes and connection details. If original framing details are not available, openings in the roofing may be necessary to confirm the connection of the members to the roof framing. Often—especially in the case of

support structures for large heavy equipment and other similarly robust structures—a competent person can readily judge the adequacy of the proposed anchorage. However, for less-robust structures such as screen wall framing, a review of the design drawings and field investigation may be required to gather enough information to form a rational basis for determining anchorage adequacy. If candidate structures are significantly deteriorated, the impact of the deterioration must be considered in their evaluation. Because they are simple to install, contractors often prefer to use rooftop appurtenant structures; however, they should not be used without confirmation that the structure can safely support the anchorage loads.

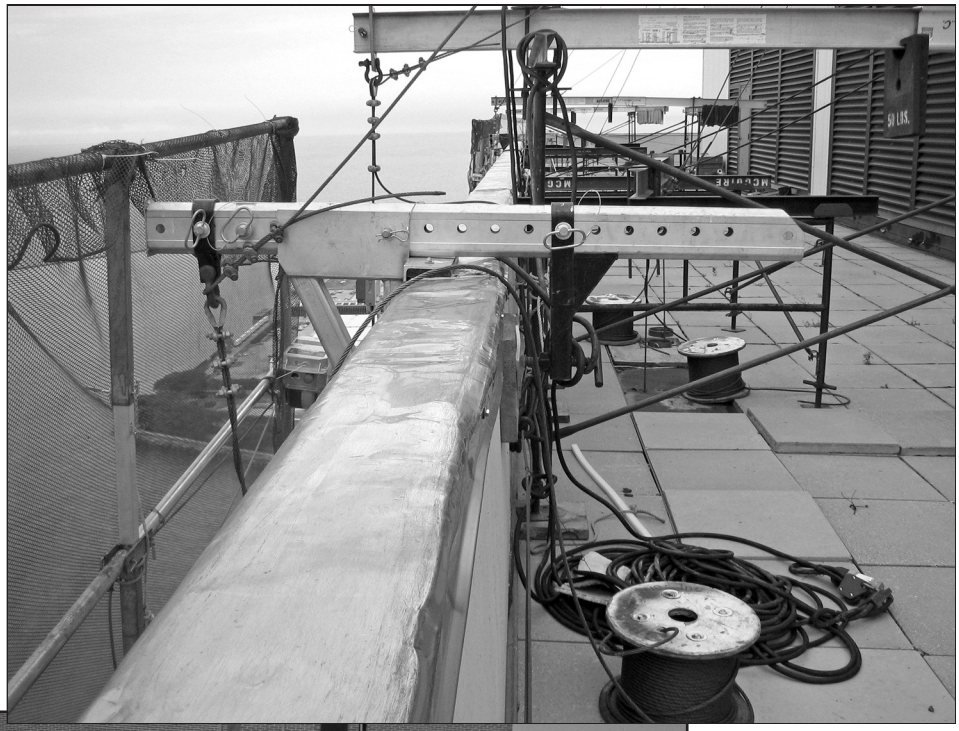

Photo 4

, also called davit sockets, are permanent anchorages structurally connected to the existing roof structure (*Photo 6*). They are configured to support building-specific davit arms from which suspended scaffolds are supported. These types of systems are load-rated by the manufacturer. Detailed information regarding the load rating should be fixed to the equipment along with the name of the manufacturer. Regular inspections are typically performed on permanent systems in order to have certification for use. Workers should request the inspection documentation to confirm that the equipment is certified for use. If the certification has expired, recertification is necessary. Recertification requires a detailed investigation to make observations of the connection between davit sockets and the building structure and load testing. Structural calculations may be required to determine capacity if rating information is not available.

Photo 5

(*Photo 7*), commonly called roof davits, lifeline anchors, or tieback anchors. Fall protection anchors typically consist of a round, steel pipe section with a steel eyelet to provide a location for cable or lifeline tie off. A steel base plate typically is mechanically anchored to the structure to provide a positive connection. These systems often are incorporated into the design of the building or retrofitted to an existing building. In some applications, connections that extend through the slab are necessary to resist the required loading. Retrofit installations require knowledge of the existing structural system, either through the availability of original drawings or through a

Photo 6

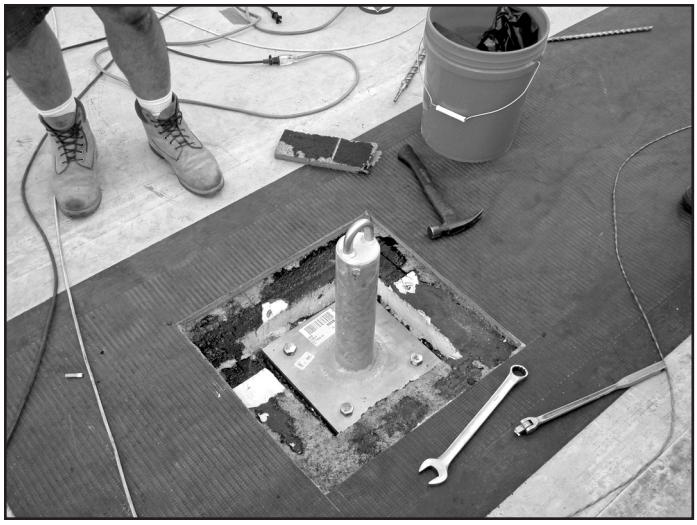

Photo 7

detailed field investigation.

are another commonly used anchorage (*Photos 8* and *9*), typically consisting of a steel eyelet shop-welded to a steel plate with mechanical anchors to provide a connection to the existing structure. In a retrofit application, knowledge of the existing wall structure is necessary to determine the adequacy of the wall structure. Typical roof-level walls are designed for wind and seismic loading only. Anchors will impart forces on the wall that typically are not considered in the wall design. Often, especially in the case of cast-in-place concrete walls and other similarly robust wall systems, a competent person can readily judge the adequacy of the proposed anchorage. However, for less-robust wall systems, such as brick veneer on metal-stud backup, a review of the design drawings and field investigation may be required to gather enough information to form a rational basis for determining anchorage adequacy.

, also called cable wraps, are horizontal cables used as anchorages for both suspended scaffold tiebacks and lifelines. Cables are run either between steel pipe anchorages or around other roof appurtenant structures, such as penthouses. The anchorages and cables both must be designed to support required loading. Horizontal cable wraps can be used for multiple devices, provided they are designed for the loads imparted by multiple components. The analysis of this type of configuration must account for the resulting forces, which are typically quite high. Tight cable wraps can be problematic since the small relative deformations and small angularity of the cable wrap imparted by the loaded tiebacks and lifelines generate very high forces in the wrap. It may be necessary to have a "loose" wrap, but one that is supported in a way that does not allow excessive movement before it provides resistance for the tieback or lifeline. Contractors installing cable-wrap systems must understand the structural capacity of the existing building components that are wrapped. A field investigation may be necessary to verify that the components are structurally anchored to the existing building with the capacity to support the loads imparted by the cable wrap. A structural engineer or other competent person should review the installation prior to use.

Other types of manufactured anchor devices are available on the market. They will not be discussed in this paper.

INDUSTRY GUIDELINES

OSHA, which began publishing safety standards in 1971, outlines its requirements in regulations or standards. These standards are organized by the type of installation (permanent or temporary) and by the type of worker activity (maintenance or construction). The standards are as follows:

- Temporary suspended scaffolding for general industry use (i.e., maintenance) is governed by OSHA 29 CFR, Part 1910, Subpart D, Standard 1910.28, *Safety Requirements for Scaffolding*.
- Permanent powered platforms for general industry use (i.e., maintenance) are governed by OSHA 29 CFR, Part 1910, Subpart F, Standard 1910.66, *Powered Platforms for Building Maintenance*, and Appendix C.
- Temporary suspended scaffolding

Photo 8

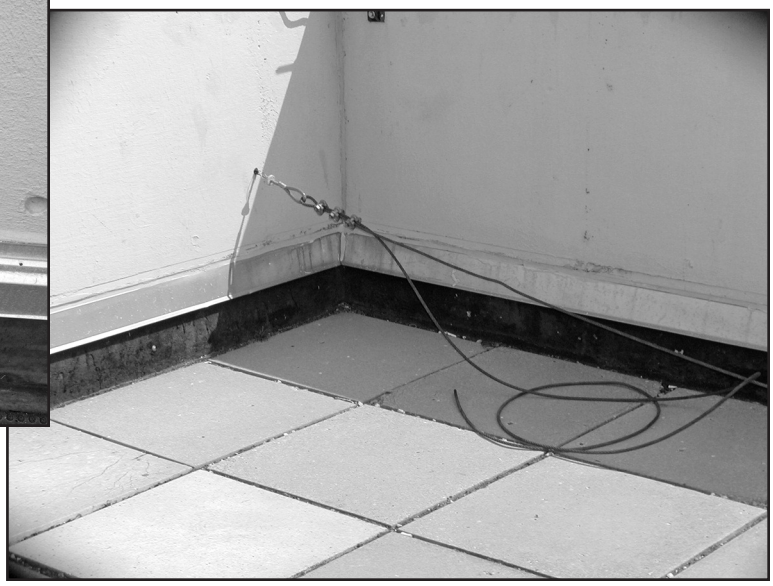

Photo 9

for construction is governed by OSHA 29, CFR 1926, Subpart L, Scaffolds, Standards 1926.450, 1926.451, and 1926.452, and associated appendices as referenced in each section of the standard.
- Fall protection for construction with the use of temporary suspended scaffolding is governed by 29 CFR 1926, Subpart M, Fall Protection.

All OSHA standards are available online at www.osha.gov.

In addition to these standards, OSHA publishes official responses to questions submitted in writing by the public that are considered important clarifications to the published standard. *Standard Interpretations* is an important resource for resolving unstated or unclear provisions of the OSHA standards. *Standard Interpretations* is also available online.

In 2001, the IWCA published the first edition of the ANSI/IWCA I-14.1 *Window Cleaning Safety Standard*. The standard includes guidelines for access to façades for maintenance-type activities. The standard provides detailed safety guidelines for the use of window-cleaning access equipment, including the design, certification, and testing requirements for anchorages.

The IWCA standard is available for purchase online at www.iwca.org.

CONSTRUCTION VERSUS MAINTENANCE

OSHA Standard 1910.66(a) states, "Building maintenance includes, but is not limited to, such tasks as window cleaning, caulking, metal polishing, and reglazing." A *Standard Interpretation* dated 11/18/2003 clarifies that work is considered maintenance if it involves "keeping equipment working in its existing state or preventing its failure or decline. In addition, the concept of one-for-one replacement versus improvement, as well as the scale and complexity of the project, are relevant."

According to OSHA, the distinction appears to hinge on whether an improvement or an alteration is being made and also on the size of the project. It is possible to replace components of a building one for one and still have the work be considered a construction activity if the magnitude of the project is of long duration or financially significant. Since it may be unclear if a project represents "construction" or "maintenance," and since OSHA is not policing on the permitting side of the project, the conservative decision might be to follow the OSHA standards that are the most demanding. This would result in the designer following the structural requirements of either OSHA Standard 1910.66 or 1926, which are essentially identical, as Standard 1910.28 lacks specific design requirements.

DESIGN REQUIREMENTS

The following are excerpts from the OSHA standards that are related to the design of roof access anchors.

> 1910.28(a)(4) Scaffolds and their components shall be capable of supporting without failure at least four times the maximum intended load.

The intended load is either the load from the personal fall protection line or the suspended scaffold tieback line.

> 1910.66(f)(3)(ii)(C) Each transportable outrigger shall be secured with a tie-down to a verified anchorage on the building during the entire period of its use. The anchorage shall be designed to have a stability factor of not less than four against overturning or upsetting of the outrigger.

The load that causes the overturning is not defined by this provision.

> 1910.66(f)(3)(iii)(A) Davits. Every davit installation—fixed or transportable, rotatable or nonrotatable—shall be designed and installed to insure [sic] that it has a stability factor against overturning of not less than four.

The load that causes the overturning moment is not defined in this provision.

> 1910.66 Appendix C I(c)(10) Anchorages to which personal fall arrest equipment is attached shall be capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used as part of a complete personal fall arrest system which [sic] maintains a safety factor of at least two, under the supervision of a qualified person.

The 5,000-lb. load is interpreted as an ultimate load. The components that resist this load shall do so without failure. Complete fall arrest systems are not the subject of this paper.

> 1926.451(a)(1) Except as provided in paragraphs (a)(2), (a)(3), (a)(4), (a)(5), and (g) of this section, each scaffold and scaffold component shall be capable of supporting, without failure, its own weight and at least four times the maximum intended load applied or transmitted to it.

This provision is for the suspended scaffold equipment, including the platform and the platform components.

> 1926.451(a)(2) Direct connections to roofs and floors and counterweights used to balance adjustable suspension scaffolds shall be capable of resisting at least four times the tipping moment imposed by the scaffold operating at the rated load of the hoist, or 1.5 (minimum) times the tipping moment imposed by the scaffold operating at the stall load of the hoist, whichever is greater.

This provision is used to determine the amount of the counterweights needed for the back span of the suspended scaffold outrigger beams. The stall load of the hoist motor can be obtained from the hoist manufacturer.

> 1926.451(d)(1) All suspension scaffold support devices, such as outrigger beams, cornice hooks, parapet clamps, and similar devices, shall rest on surfaces capable of supporting at least four times the load imposed on them by the scaffold operating at the rated load of the hoist (or at least 1.5 times the load imposed on them by the scaffold at the stall capacity of the hoist, whichever is greater).

This provision provides design criteria

for checking the existing structure for vertical and lateral loads imparted by the suspended scaffold equipment.

> 1926.502(d)(9)(i) Except as provided in paragraph (d)(9)(ii) of this section, when vertical lifelines are used, each employee shall be attached to a separate lifeline.
>
> 1926,502(d)(15) Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used as follows:
>
> 1926.502(d)(15)(i) as part of a complete personal fall arrest system which [sic] maintains a safety factor of at least two…

Complete fall arrest systems are not discussed in this paper. The 5,000-lb. load is interpreted as an ultimate load. The anchors used for fall arrest equipment should be designed for this load without failure.

The following are excerpts from the IWCA standard that are related to the design of roof access anchors.

> 5.8.21 Suspension Devices for Transportable Suspended Powered Platforms:
>
> (a) Suspension to permanent equipment or anchorages shall be in a straight line with no more than 15 degrees angulation (see appendix) in either direction.

In the event of an equipment failure, if the cable is more than 15° from a straight line to the edge of the roof as the cable moves laterally to a straight position, the equipment will drop vertically and swing laterally. This provision is intended to reduce this hazard. OSHA does not have a similar provision.

> 9.1.1 Anchorages shall be capable of sustaining a 5,000-pound minimum load or a minimum 4-to-1-safety factor; whichever is greater, in any direction that a load may be applied.

The 5,000-lb. load and a design load with a 4-to-1-safety factor are interpreted as ultimate loads. The anchors used for roof access should be designed for this load without failure.

> 9.1.2 Anchorages, if used for more than one lifeline, shall have the load factor multiplied by each user.
>
> 17.2.1 Davits may be used to support window cleaning activities, providing they are not used within ten feet of high-voltage lines; and
>
> a) The davit is designed by a registered professional engineer.
> b) The davit has a stability factor of at least 4 to 1 against overturning. Each davit shall be designed to support an ultimate load of not less than four times the rated load (based on the rated load of the hoist when supporting a powered access platform).

This provision is similar to OSHA. OSHA does not have a provision that the roof access anchor must be designed by a registered professional engineer. As stated previously, the design loads are ultimate.

> Ideally, anchors are to be placed in line with the suspended worker(s). Where this is impracticable, anchors may be offset not more than 15 degrees from in line (perpendicular), provided displacement of the rope under load can be prevented.

This provision allows an offset not more than 15° and also requires that cable or stays are used to prevent the cable or lifeline from straightening in the event of an accident.

Two related but separate requirements are provided in OSHA regulations: personal fall arrest or lifeline anchorages, and equipment anchorages for the suspension scaffold equipment. The regulations provide design forces for each application.

The OSHA regulations for personal fall arrest anchorages require a minimum strength of 5,000 lbs. per worker. Multiple workers can be anchored to a single roof access anchor, provided the anchor is designed for such access. Roof access anchors shall be independent of any anchorage being used to suspend scaffold equipment.

The OSHA regulations for roof access anchors for equipment tiebacks require a minimum strength of four times the rated load of the scaffold hoist motor. Based on these criteria, a roof access anchor used for equipment tieback that is designed for 5,000 lbs. can support a suspended scaffold with a hoist motor rated no higher than 1,250 lbs.

The IWCA standard provides guidance on roof access anchor layout, stating that anchors may be located no more than 15° from a perpendicular line to the roof edge. This provision can be violated provided cable stays are installed to prevent the lifeline from straightening out in the event of a failure.

The combined requirement that personal fall arrest anchors for each worker must be independent of equipment anchorages and that anchorages may be located no more than 15° from a perpendicular line to the roof edge can result in a significant number of permanent roof access anchors. Detailed layout studies are necessary to provide the number of anchors that meet the requirement of the OSHA and IWCA provisions in order to minimize the number of anchors.

Factors to consider when developing an anchorage layout that meets the design requirements include the following:

- Each suspended scaffold platform requires two façade access anchors for the platform equipment and one façade access anchor for each worker (unless each anchor is designed for multiple workers).
- Façade access anchors for suspended scaffolding equipment cannot be used simultaneously by two different setups.
- Consider placement of façade access anchors near the center of the roof to provide maximum offset from the roof edge in order to have wider coverage (the IWCA 15-degree rule). Roof anchors should be placed at least 6 ft. from the roof edge unless

fall protection is provided along the rood edge. Locating façade access anchors in the center of the roof will also allow use from each side of a building.

- Rooftop equipment may represent an obstruction for clean, efficient layout of façade access anchors. If the equipment frame cannot be used as an anchorage point, anchors will be required to avoid the equipment.

EVALUATION AND TESTING REQUIREMENTS FOR ANCHORAGES

1910.66(g) Inspection and tests.

1910.66(g)(1) Installations and alterations. All completed building maintenance equipment installations shall be inspected and tested in the field before being placed in initial service to determine that all parts of the installation conform to applicable requirements of this standard, and that all safety and operating equipment is functioning as required. A similar inspection and test shall be made following any major alteration to an existing installation. No hoist in an installation shall be subjected to a load in excess of 125 percent of its rated load.

OSHA does not include loading requirements for the testing of the roof access anchors for permanent powered maintenance platforms. The 125% of rated load is for the hoist equipment.

1910.66(g)(2) Periodic inspections and tests.

1910.66(g)(2)(i) Related building supporting structures shall undergo periodic inspection by a competent person at intervals not exceeding 12 months.

1910.66(g)(2)(ii) All parts of the equipment, including control systems, shall be inspected and, where necessary, tested by a competent person at intervals specified by the manufacturer/supplier, but not to exceed 12 months, to determine that they are in safe operating condition. Parts subject to wear, such as wire ropes, bearings, gears, and governors shall be inspected and/or tested to determine that they have not worn to such an extent as to affect the safe operation of the installation.

1910.66(g)(2)(iii) The building owner shall keep a certification record of each inspection and test required under paragraphs (g)(2)(i) and (ii) of this section. The certification record shall include the date of the inspection, the signature of the person who performed the inspection, and the number, or other identifier, of the building support structure and equipment which [sic] was inspected. This certification record shall be kept readily available for review by the Assistant Secretary of Labor or the Assistant Secretary's representative and by the employer.

II(b)(2) The anchorage should be rigid and should not have a deflection greater than .04 inches when a force of 2,250 pounds is applied.

I(b)(2) The anchorage should be rigid and should not have a deflection greater than 0.04 inches when a force of 2,250 pounds is applied.

The loading described in these two sections is used to measure the stiffness of the roof-anchor assembly.

8.1.1 Newly Installed Equipment

(a) Before initial use by the window cleaner(s), the following equipment (as provided for a specific building) shall be successfully demonstrated by the vendor with the rated load under the complete range of operation and be so certified in writing:
   1) Permanently installed access platform(s) or its supporting fixtures
   2) Anchorages

8.1.2 Inspection and Retesting of Existing Equipment and Systems

(a) Before each use, all components of a window cleaning equipment support system permanently dedicated to the building shall be visually inspected by a competent person. Any signs of excessive wear; weld or material cracks; bent, distressed, or rusted metals; corrosion or abraded fibers shall be cause for more extensive inspection or testing before continued use.
(b) A record of all inspections, testing, certifications, modifications, and repairs shall be documented in a dedicated log book.
(c) The certification record shall include the date of the inspection and test and the signature of the inspector.

8.1.3 Minimum Inspection and General Testing Criteria

(a) Fall arrest components shall be inspected and tested as prescribed by ANSI Z359.1.
(b) Anchorages shall be inspected in accordance with Section 8. Designated anchorages, targeted for post-installation testing, shall be tested by applying a minimum static load of twice the design load in each (primary) direction that a load may be applied. For example, anchorages designed for a 5,000-pound ultimate load shall be tested at 2,500 pounds.

The design load is the static force imparted on the system, a 5,000-pound ultimate load with a factor of safety of four equates to a 1,250-pound static load for the personal fall-arrest system. It is common practice to test post-installed anchors to 150% of the static load. Testing these systems to 200% of the static load is reasonable, provided a deflection criteria is also included, as is required by OSHA 1910.66.

9.1.9 Anchorages shall be inspected annually by a qualified person. Anchorages shall be recertified when reroofing or renovating (pertinent to the window-cleaning system) or at periods not to exceed 10 years. The report of this inspection shall be included in the building's log book. If, during the anchorage's inspection, an area of suspicion is identified, a test procedure, if necessary, shall be performed under the approval of a registered professional engineer.

9.1.10 Certification and recertification of anchorages shall be under the supervision of a registered professional engineer.

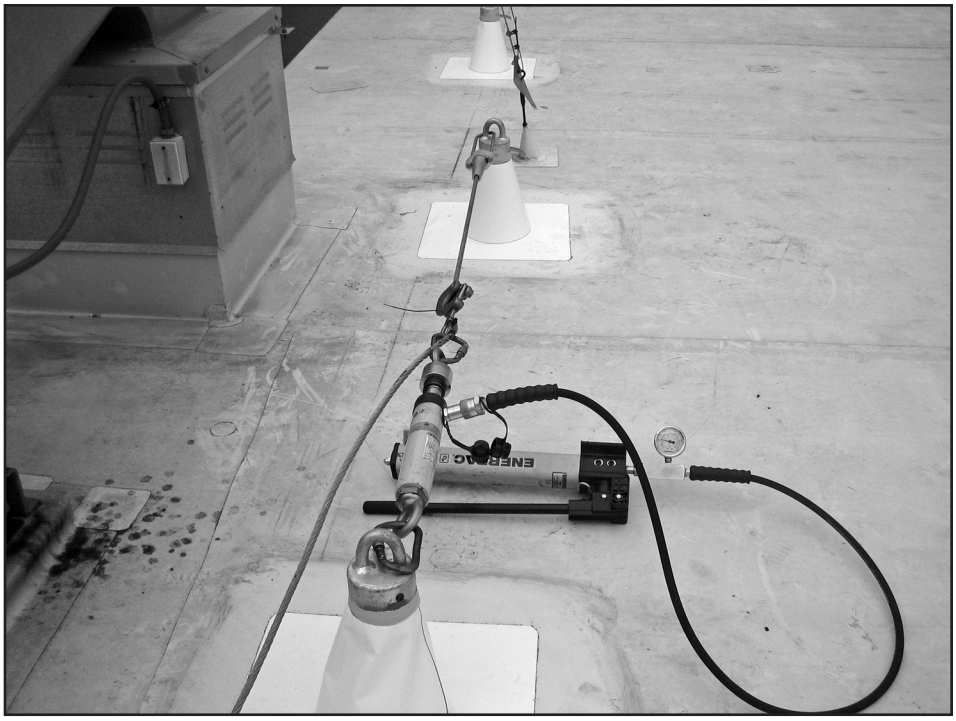

Photo 10

Property owners must keep on site a written record of each inspection and test performed so that it is available for review.

OSHA requires that all anchorages be tested before being used for the first time. Retesting is not required unless there is a "major alteration." Periodic inspection by a competent person at a minimum shall occur every 12 months. A competent person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions and who has the authority to take prompt corrective measures to eliminate them.

OSHA leaves the specific requirements of structural testing to the judgment of the qualified person. A qualified person is one who, by possession of a recognized degree, certificate, or professional standing, or who, by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems related to the subject matter, the work, or the project.

IWCA requires that anchorages be inspected annually by a qualified person. IWCA additionally requires that anchorages be certified (i.e., tested) before initial use; after reroofing; after modification of the window-cleaning system; when, upon inspection, distress or damage is identified; and at periods not to exceed ten years.

IWCA requires that roof access anchors be tested by applying a static load of twice the "design" load in each direction that the load may be applied. This means that for personal fall-arrest anchorages, the required applied load is 2,500 lbs.; and for equipment tieback anchorages, it would appear to require, for instance, a minimum applied load of 2,000 lbs. for a swing stage with a hoist motor rated at 1,000 lbs., though anchorages are typically tested with an applied load of 2,500 lbs. under the IWCA requirements.

OSHA requires that the anchorage for permanent house rig equipment and for permanent tieback and fall protection anchorages not have a deflection greater than 0.04 in. when a force of 2,250 lbs. is applied.

TESTING STANDARDS

Roof access anchors are required to be tested in the direction of anticipated loading. In most installations, the roof access anchor would be loaded towards the roof edge in the event of a failure. We have often reviewed proposed testing procedures submitted by reputable anchor installers that detail testing procedures for parallel-to-roof testing. Parallel-to-roof testing often requires a cable and a jack that allows the anchors to be pulled towards each other (*Photo 10*). Parallel-to-roof-edge testing violates the requirements of IWCA Standard 8.1.3(b), which states that the test load must be applied in each primary direction that a load may be applied. In the event of an equipment failure, the direction of force will be perpendicular to and toward the roof edge.

Testers complain that it is "impossible to test in the direction required by IWCA." Although it takes additional effort to test in the required direction, it is not impossible.

In our experience, checking the status of existing façade access anchors before using suspended scaffolding, building owners typically lack awareness that they are responsible for providing a written record of each inspection and test for anchorages. In such instances, the façade access anchors should be reevaluated, an effort that might have been unnecessary had the building owner maintained adequate records.

FUTURE DEVELOPMENTS

The Architectural Engineering Institute (AEI) of the American Society of Civil Engineers (ASCE) is currently scheduled to publish a guideline for the design, evaluation, and testing of façade access installations in the fall of 2012. The objective of the guideline is to provide guidance to architectural and structural engineers on the structural loading that should be considered in the design, evaluation, and testing of structural members that are part of façade access installations.

The IWCA is currently working on a revised edition of its inaugural 2001 edition. The publication date has not been made public.