JPM Building Systems

The Facade System Experts

Window Washing Safety System / Façade Maintenance Safety System

- Presented by:
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BIO

- **James (Jim) May, CPM**
- **Vice President – JPM Building Systems**
- **20 years experience working on Façade Maintenance Safety Systems (Window Washing Safety Systems) under the direction and guidance of a professional engineer.**
- **25 years CPM property management experience. Managed commercial, retail, medical and industrial properties for Hines Interests, Asset Plus and Hermann Hospital.**

- **David May**
- **Co-Owner – JPM Building Systems**
- **10 years experience working on Façade Maintenance Safety Systems (Window Washing Safety Systems) under the direction and guidance of a professional engineer.**
- **Co-Owner of JPM Carpet and Hard Surface Maintenance since 1994.**

Description of Course

- Our training course will cover Davit Bases, Davit Arms, Tiebacks and Anchor Points. These are the components of the Façade Maintenance Safety System (Window Washing Safety System)
- We will explain what components are needed, when they are needed and the types of equipment that can be used. We will also explain how often your system needs to be tested, inspected and what qualifications are needed to do the testing and inspections.

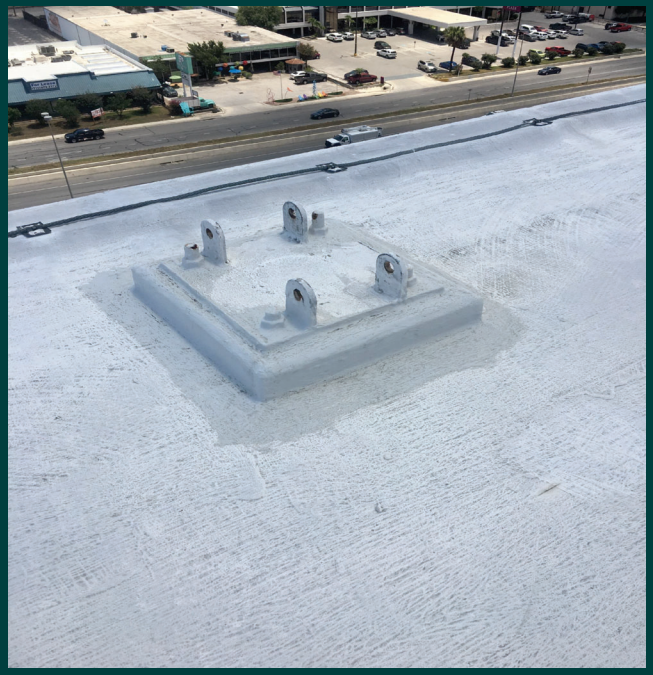
What does a safety system consist of?

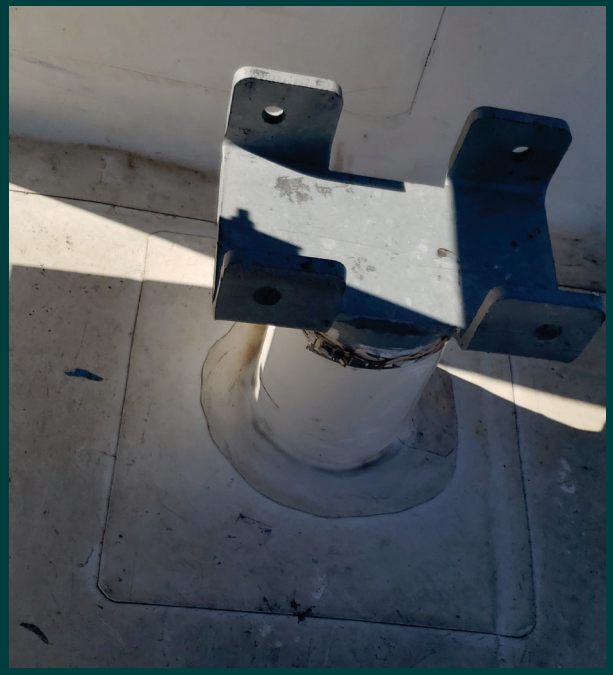
- Davit Bases
- Davit Arms
- Davit Socket (Boot)
- Counter Weighted Davit Arms
- Tiebacks
- Anchor Points
- Restraint System

Davit Bases

Davit pedestal bases are permanently secured to the building's structure as the main support for the arm.

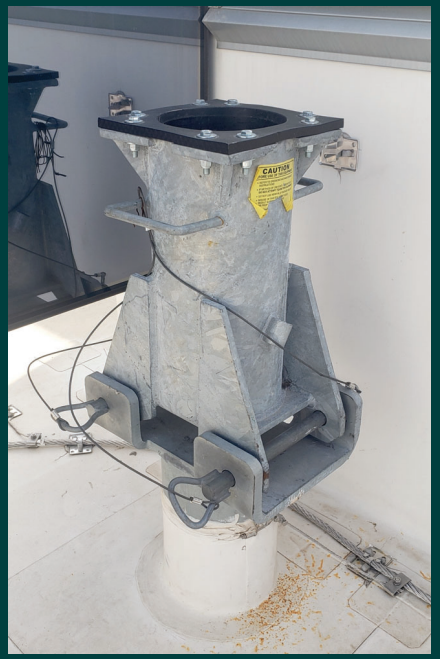
This base is considered as an anchor point.





Davit Socket (Boot)

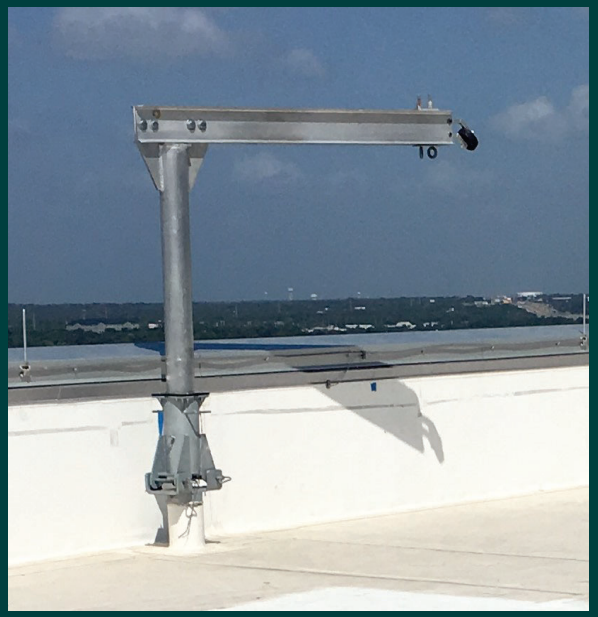
- Davit sockets are used to connect the davit arm to the davit pedestal base.
- These are attached to the davit base by pins. These pins need to have locking clips.



Davit Arms

The davit arm consists of 2 main components: the mast and the boom.

Davit arms are inserted into the davit socket.



Counter Weighted Davit Arms

There are several styles of counter weighted arms.

Some are set on bases (as seen here)
Some are on wheels.

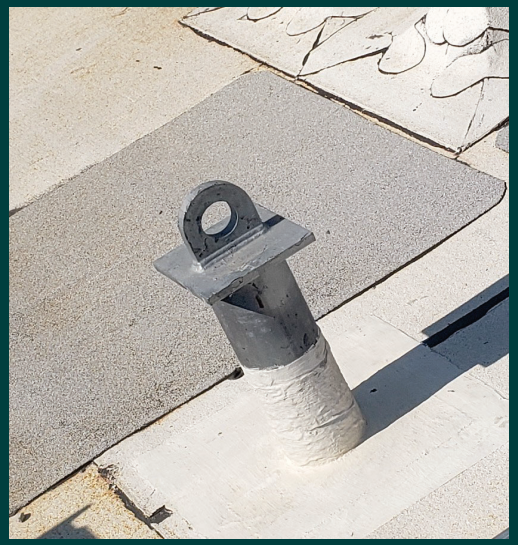
All counter weighted arms must be tied to a certified anchor point.

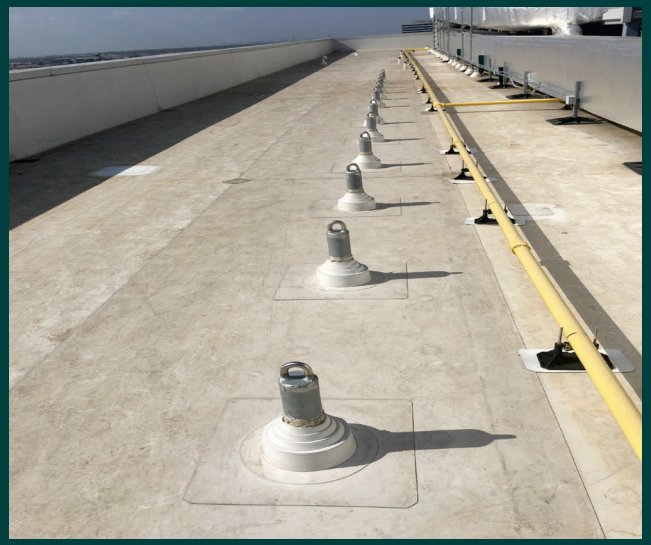
They can not be moved once a person is over the side of the building.

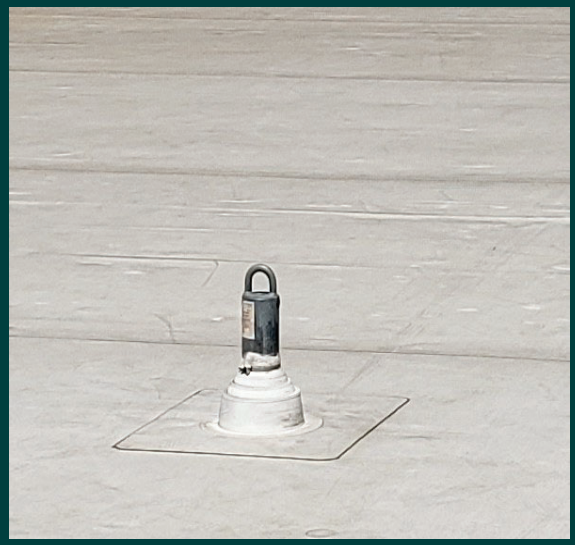
Tiebacks

When using davit arms, tiebacks are required for a second anchor point.

When using counter weighted arms and bosun chairs, two tiebacks / anchor points are required for each drop point.







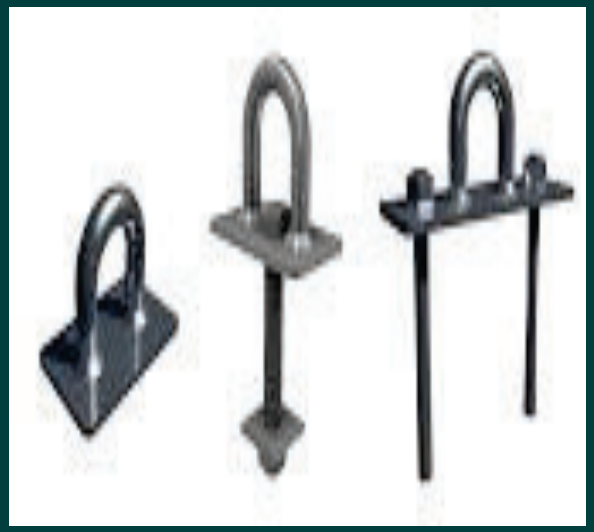
Anchor Points

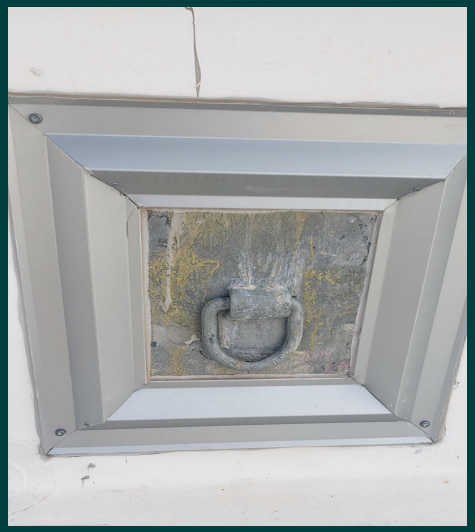
These are some of the anchor points currently in use. Some are embedded in the concrete during construction.

Others are attached by drilling through the concrete and a plate is attached to secure it.

Others are attached with epoxy.

If attached by epoxy, two bolts are required.





What is a safety restraint system & when is it needed?

- Parapet lower than 42 inches & working within 6 feet of edge
- Rooftop fall protection anchors are designed to protect a worker from falling off the building.
- Not to be used for direct façade work

Load Test, Visuals & Certifications

These anchors are capable of withstanding an ultimate load of 5,000 lbs in any direction to allow for the suspension of scaffolds or Bosun chairs.

After installation, system will be tested at 2.5 times the working load.

Working load is under 1,000 pounds, test at 2,500 pounds

Load Testing Requirements - 2,500 vs. 5,000

Letter to OSHA & OSHA Response - 2019

- **Question – International Window Cleaning Association/America National Standards Institute (IWCA/ANSI) l-14.1-2001 Section 8.1.3 requires that anchorages "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, an anchorage with an ultimate capacity of 5000 pounds (2268 kg) has a four to one safety factor. Therefore the anchor's design load is 1,200 pounds (675 kg) and it shall be tested at 2500 pounds (1134 kg). "Under 29 CFR 1910.27(b)(1)(i), must anchorages be tested at 5000 pounds, or is it permissible to test them at 2500 pounds, as described in IWCA/ANSI I-14.1-2001 ?**
- **Response – 29 CFR 1910.27(b)(1)(i) requires that building owners inform employers, in writing, that the building owner has identified, tested, certified, and maintained each anchorage so that it is capable of supporting at least 5000 pounds, in any direction, for each worker attached. Certification of each anchorage must be performed by a qualified person. Because the OSHA standard does not specify criteria for testing anchorages, the qualified person may utilize any scientifically-valid testing criteria to determine whether an anchorage is capable of supporting at least 5000 pounds (2268 kg) per attached worker. In general, this means using criteria that would be accepted by an industry consensus group, or that are certified by a registered professional engineer. OSHA would consider the testing criteria described in your letter – wherein an anchorage with a 5000-pound ultimate capacity/strength and a four to one safety factor with a design load of 1250 pounds is tested at 2500 pounds – to be acceptable under 29 CFR 1910.27(b)(1)(i).**

Personal Fall Arrest Systems Codes:

Occupational Safety & Health Admin. (OSHA)

1926.502(d)(16) Personal fall arrest systems.

1926.502(d)(16)(ii) limit maximum arresting force on an employee to 1,800 pounds (8 n) when used with a body harness.

1926.502(d)(16)(iii) be rigged such that an employee can neither free fall more than 6 feet (1.8 m), nor contact any lower level.

1926.502(d)(16)(iv) bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet.

1926.502(d)(16)(v) have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet or the free fall distance permitted by the system, whichever is less.

American National Standards Institute (ANSI)

ANSI I-14.1-2001 - Window Cleaning Safety

What buildings need a Façade Maintenance Safety System?

- Buildings 36’ tall or 3 stories are required to have roof davits (tie-backs) unless you can achieve window washing and unscheduled maintenance from ground-based equipment.
- At 48’ or 4 stories, you must provide a safety system regardless of ground-based equipment capability.

What are the requirements for the use of stages & not bosun chairs?

Building Under 300'	Building heights 300' and under are permitted to use Rope Descent Systems (bosun chairs). Buildings over 150' to 300' are recommended to use stages.
Building over 300'	Building heights greater than 300' only permitted to use Rope Descent Systems under special circumstances (where stage work cannot be done). Davit Bases, Davit Arms, & Tiebacks are required

To provide the safety required, how is the equipment used?

- **Two tie points within 15 degrees either side of the drop point.**
- **Each worker's lifeline independent and separate from chair or stage anchor**

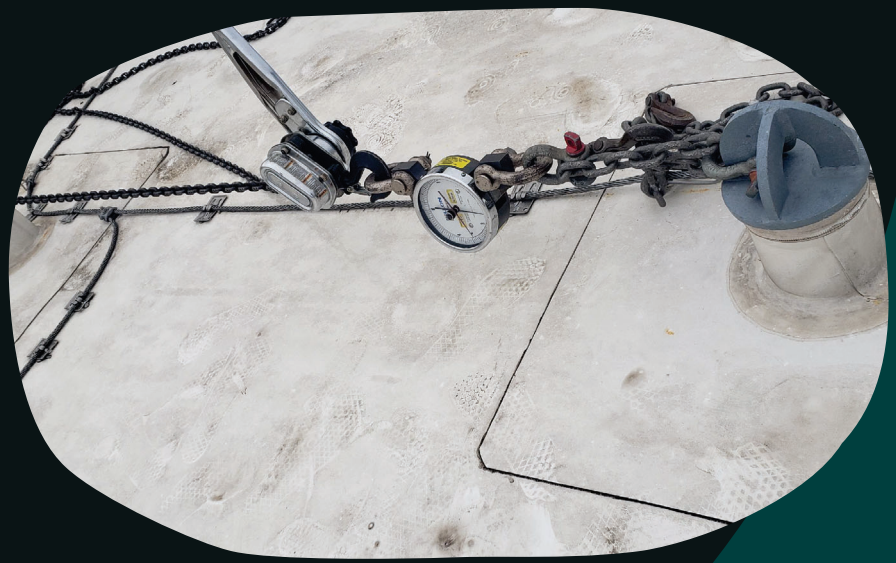
Why use Davit Arms when using bosun chairs?

- Prevent damage to edge of roof.
- Prevent damage to cap of parapet.
- This employee has 2 anchor points on the roof. One for the chair and one for his safety line.

Reasons for Visual Inspections.

- Review design
- Review safety procedures
- Check for any movement
- Check for cracks or broken welds
- Check for signs of rust or corrosion.
- Look for maintenance needed
- Report any problems including missing parts
- After the inspection, a report with either passing or failing is sent to the building owner or property management company for their records.
- This system may not be legally used until it has passed inspection.

Reason for the need of Load Tests.



To ensure that the system has not been damaged – Roofers / window washers.

That the addition of new equipment has not blocked access to tie off points.

System still meets code.

Review of design

Review of safety procedures

Inspect equipment for flaws, damage or required maintenance

Most PE’s recommend a Load Test at least every five years. Current code says no longer than every 10 years. This may vary in different jurisdictions.

Provide professional engineer's signed and stamped certification upon passing test

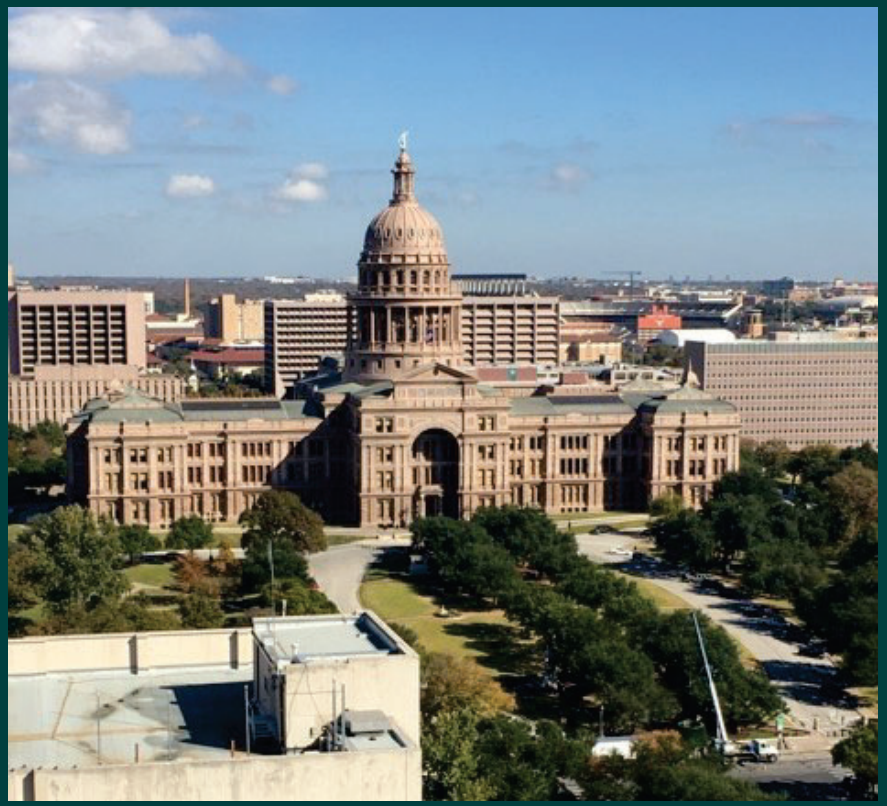
This system may not be legally used until it has passed Load Test.

Certifications

- A new certificate is required after each test and inspection.
- They are good for one year.
- It shows what was tested or inspected.
- Lists all parts of the system.
- Addresses concerns with the system.
- Provides recommended maintenance to the system.

Who can do the Load Tests & Visual Inspections?

- All Load Tests must be done under the guidance of a Professional Engineer.
- All Visual Inspections need to be done by a qualified person trained and working under the guidance of a Professional Engineer.



Thank You!!!