Description
The Controlled Descent Apparatus (CDA), or more commonly referred to, as a boatswain chair is one of the most common types of equipment employed for exterior building maintenance. The preferred method in California by Cal-OSHA is the suspended scaffold system. Chairs are considered conventional equipment supplied by the window cleaning. A controlled descent apparatus is primarily intended to allow downward movement only. The Controlled Descent Apparatus is the mechanism that allows the window cleaning technician to descend downward in a safe manner.

Independent Anchorages Required
When using a boatswain chair, you must have two lines secured to approved independent anchorages. The boatswain chair line, or “suspension line” is secured to one anchorage, and the “safety” or “lifeline” is secured to another anchorage. The chair is rigged directly to roof anchors in line with the point of suspension, and the primary synthetic rope suspension lines are normally protected at the roof edge using contractor supplied carpet or other anti-abrasion protection devices. Alternatively, contractor supplied equipment such as outrigger beams with counterweights, parapet wall clamps or cornice hooks can be used to suspend the chair if they are approved. These devices must be tied back to permanently installed safety anchors.

Note: When the roof edge is not capable of supporting the applied loads, primary suspension support equipment such as outriggers supported on blocks or beam dollies, or davits, must be considered. A separate independent wall or roof anchor is required to secure the worker’s lifeline.

Cal-OSHA Ruling on Controlled Descent Apparatus’ (CDA)
When using such equipment for window cleaning applications, its design, use and maintenance shall conform to Cal-OSHA ruling, Article 5, §3286. Cal-OSHA expects employers whose employees use descent control devices to implement the following procedures and precautions:

• Have documentation on file that employees have been trained by a competent person.
• Review with employees of the written detailed work procedures for the work site provided by the building owner.
• Inspection each day before use of all equipment.
• Proper rigging, procedures utilized.
• Use of separate fall arrest system, which will quickly stop the employee’s fall.
• Ropes are effectively padded where they contact surfaces, which might cut or weaken the rope.
• While suspended, window cleaners shall not reach further than six (6) feet in any direction.

Note: On October 25, 2001, the American National Standards Institute (ANSI) approved the International Window Cleaning Association (IWCA) I-14.1 Window Cleaning Safety Standard for publication as ANSI/IWCA I-14.1-2001. This standard addresses the safe use of descent control equipment i.e. rope descent systems (RDS) shall not exceed 130’-0” (40 m) above grade unless the windows cannot be safely and practically accessed by other means.

Use (Controlled Descent Apparatus)
When performing descents over 130 feet (40 m), special attention shall be given to prevent against dangers associated with wind, length of time workers are suspended, the ability of the rope descent apparatus to function without the worker to apply excessive force and the ability to provide a prompt rescue in the event of an emergency. Additionally, in California, special written permission from Cal-OSHA is required for descents over 130 feet (40 m).

Primary Suspension Support Options
Contractor Supplied Equipment
A rope descent system may be suspended from equipment or anchorages permanently dedicated to the building or equipment that is transported from building to building, providing that the design of the support apparatus and the part of the structure where it is placed has been approved by a professional engineer specifically for rope descent system use.

Contract Services Group, Inc. (CSG) is licensed (SIT#27) by Cal-OSHA to provide inspections, testing and certifications to high rise window cleaning equipment. CSG also provides window cleaning services to more than 100 commercial buildings in California and Nevada.
Description
Permanent scaffolds or platforms should be installed on all buildings exceeding 130'-0" feet (40 m) in height.

Cal-OSHA Ruling
When using a permanent powered scaffold for window cleaning applications, its design, use and maintenance shall comply with the provisions of General Industry Safety Order (GISO Article 6, Section 5, Window Cleaning. All nonpermanent scaffold installations installed prior to July 1, 1993 and after September 29, 1974 shall comply with all provisions of Article 6, Appendix D. Permanent scaffolds installed prior to September 29, 1974 shall be inspected, tested and maintained in accordance with the provisions of Article 6, Appendix D.

- Employees should be trained by a competent person in the use and care of suspended scaffolds before use.
- It is the building owner, manager or operating agents’ responsibility to have the permanent powered scaffold inspected on an annual basis, prior to use and after every 30 day cycle of usage. A copy of the inspection is to be given to the window cleaning contractor before use.
- Workers should continuously monitor the components of the scaffold while operating it.

Permanent scaffolds are or can be equipped with added safety features over and above that required for non-permanent platforms in compliance with OSHA 1910.66. Support F e.g. tall stirrup design which provides a means of suspension to restrict platform inboard to outboard roll, screened in platform, stabilizer tie-in devices, fire extinguisher, building face rollers, casters, power cable bin, and primary cable wire winders. Permanent scaffolds should be equipped with a wind sway protection system if dropping from heights above 130'-0" feet (40 m). An emergency action plan is also required.

Electrical power outlets are to be located on each roof level no more than 100'-0" (30 m) from window cleaning/suspended equipment locations. Permanent powered scaffolds require 230 volts. The outlets should not experience more than 3% voltage drop under full load.

Permanent scaffolds are also equipped with added electrical safety features e.g. 3 phase reversal and phase failure, upper limit control device, slack wire rope device, overload limiting device and lateral leveling.

Normally a modular-type platform, permanent platforms are usually manufactured aluminum and are available in connectable sections designed to suit building platform “drops.” Accessories include: building face rollers to protect the building face; special adjustable roller or caster systems for use on sloping glass surfaces; and walk-through type stirrups to extend platform beyond suspension points.

Steel cable primary suspension lines are attached to primary suspension supports on the roof. ‘T’ type platforms employ two-cable suspension with separate fall arrest lifelines tied off to their own independent rooftop safety anchors. ‘F’ type platforms employ four-cable suspension with fall arrest lanyards secured to the platform (no separate hanging lifelines).

‘T’ type platforms are more commonly used for window cleaning on buildings under 130'-0" (40 m). Type ‘F’ platforms are more commonly used on buildings over 130'-0" (40 m) due to concerns for weight and stabilization of hanging lines i.e. wind hazard.

Use
Permanent powered scaffolds are mandatory in California State for buildings of 130'-0" (40 m) height or higher.

Contract Services Group, Inc. (CSG) is licensed (SIT#27) by Cal-OSHA to provide inspections, testing and certifications to high rise window cleaning equipment. CSG also provides window cleaning services to more than 100 commercial buildings in California and Nevada.
INDEPENDENT ANCHORAGE SYSTEMS
Safety anchors are an affective and practical means of directly securing boatswain chairs with controlled descent apparatuses. They are also used to secure lifelines and to tie back primary suspension equipment such as conventional (contractor supplied) outriggers and parapet wall clamps.

The chair suspension line is rigged directly to an anchor in line with the point of suspension. A separate independent anchor on the roof is required to secure the worker’s fall arrest lifeline.

Cal-OSHA Ruling on Anchors and Fittings

- An installed anchor shall not be used for any purpose other than attachment of window cleaner’s primary work line, and lifeline.
- All window anchors and fittings shall comply with the applicable portions of Section 4.5 of ANSI/ASME A39.1-1991, Safety Requirements for Window Cleaning.

Note: Inspection of window cleaning anchors and fittings on buildings shall be conducted at least every 12 months. Anchors and fittings subject to impact loading or other structural damage shall be replaced. It is the building owner’s responsibility to ensure that all building equipment be inspected annually. In California these anchors may only be inspected by an individual certified by Cal-OSHA issued an Scaffold Inspection Testing (SIT) license.

Use
Primary suspension supports for boatswain chairs employing descent control equipment.

Contract Services Group, Inc. (CSG) installing roof anchor.

CSG conducting load testing on window cleaning roof anchor.

CSG Cast in Place Roof Anchor
DAVIT SYSTEMS

Davits are used singularly or in pairs, and provide an efficient means for suspending boatswain chairs, or platforms. Aluminum davits are the most popular due to weight and ease of handling. Davits can be used on buildings with various terrace levels. Each worker’s lifeline must be secured to a separate independent safety anchor on two wire rope suspension systems. On four wire rope suspension systems, an independent safety line is not required.

Davit Types

Portable Davits: dedicated to a specific building and capable of being moved manually from work location to work location within a dedicated area.

Fixed Davits: designed to remain at a fixed location. Normally used for difficult to access areas where an extra long reach is required.

Roof Riggled Davits: a davit used to raise the suspended working platform above the building face being cleaned. The platform can also be rigged on the roof and then swung over the parapet, or rigged on the ground. Normally davit arms are 7'-0" (2134 mm) higher than the parapet wall to allow for roof rigging and equipped with transport wheels and winches for ease of use.

Davits may be used to support window cleaning activities providing they are not used within 10 feet (3 m) of high voltage lines and must conform to these regulations:

• Davits must be designed by a registered professional engineer
• Davits must have 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 4 times the rated load.
• Suspension rope(s) can be attached to davits if used with a safety hook or a screw pin shackle.
• Portable davits shall not have an arm-reach exceeding eight (8) foot, six (6) inches (2.6 m) measured from the primary rope support to the centerline of the davit.

Use

Suitable for any building height depending on type of davit selected and where adequate structural support is provided. Can be mounted on roof, terrace or parapet depending upon application.