

Loss Control Tips

Mast Climbing Scaffolds Introduction

Mast climbing work platforms (MCWPs) have become increasingly popular in construction over the last ten years, particularly in the masonry industry. Mast climbing work platforms can be used as a single tower or as multiple towers braced together. The platform climbs the mast powered by an electric or gas engine. MCWPs are best suited for medium to high-rise projects with long span walls and are commonly used for brick and masonry work, painting, stucco, glazing, restoration, and window installation. Most low to medium height systems are freestanding, whereas high-rise applications must be tied to the structure at regular intervals as determined by the manufacturer.

MCWPs were first used in Europe during the 1970's and did not appear in North America until 1982. Most platforms are built of a modular design enabling the scaffold to be assembled and disassembled faster than conventional tubular frame scaffolds. Platform capacities range from 770 pounds to over 25,000 pounds and vertical travel speeds range from 3 to 40 feet per minute. Single platform lengths range from 7 – 75 feet and MCWP systems can reach heights of 500 feet or more. The power units for the European models generally use rack and pinion design for lift whereas most North American manufacturers use hydraulic lifting technology. Some models offer side wings with counterweights, which allow long corner returns, and others provide weather/overhead protection.

Benefits of Use

MCWPs have replaced other forms of scaffold in construction because of the gains in productivity and efficiency that they can generate. The long platforms allow workers to move easily across the width of the wall or structure keeping materials readily at hand. MCWPs offer the flexibility to accommodate 90° angles, and the use of swivel bridges, or wings, allow angles from 0° to 180° for configuration of the MCWP around any building.

Unlike conventional scaffold, the entire platform moves with the workers which greatly increases efficiency and allows employees to work at the optimum height at all times. Bricklayers can perform their job safer when materials are close at hand and at a comfortable working height. Standard platforms of mast climbers are 7' wide, compared to the 5' wide conventional frame scaffold, which allows additional material storage and safe passageway. An entire pallet of brick or block can be loaded anywhere on the platform, which reduces the need for workers to bend, reach, or lift excessive weights using awkward postures throughout the workday.

Another important benefit of MCWPs is their ease of erection and dismantling. They offer mobile chassis on their base for faster set-up and quicker assembly/disassembly. MCWPs are also easier to anchor into the building structure than conventional frame scaffold. MCWP manufacturers report set-up times 30 – 40% faster than conventional frame scaffold. Since the platform can be brought to the ground for restocking materials such as brick and block, these scaffolds reduce the need for high-reach material moving systems.

MCWPs provide access to great heights with significantly less components to ship, assemble, and disassemble than frame scaffold systems. MCWPs offer far greater stability, heavier load capacities, faster travel speeds, and larger work areas than suspended scaffolds, which were often the scaffold of choice for high-rise projects. All MCWPs are equipped with safety devices such as fail-safe braking systems, limit switches, guardrails, and anchor points for fall arrest systems.

Fatal Incidents

Compared to conventional frame scaffold and suspended scaffold, the potential for fall-related accidents is reduced when using mast climbers since workers stay on a wide, secured platform even during erection and dismantling. Statistics have shown that fewer accidents are occurring when working on mast climbers despite their increased use over the last few years. It is estimated that over 7,500 MCWPs were in use within the United States in 2006.

Although workers derive many benefits from the use of MCWPs, especially relating to fall protection and ergonomics, their use is not fool-proof. A number of catastrophic incidents have occurred while working from MCWPs and the majority of these incidents were attributed to poor training and supervision.

The following is a partial list of catastrophic incidents relating to the use of mast climbers.

- 4/3/06, Boston, MA: A 20,000 pound platform collapsed and then fell 13 stories killing two workers and one passer-by; refer to the OSHA News Release (2006 – 09/29/2006 – U.S. Labor Department's OSHA Cites Contractor for Fatalities in Boston Scaffold Collapse).
- 9/24/03, Brick, NJ: A worker fell 40' due to lack of a barrier on a MCWP.
- 9/9/03, Camden, NJ: While being dismantled, a 120' MCWP became unstable causing a worker to fall.
- 6/27/03, Philadelphia, PA: A worker was killed when he fell 85' from a MCWP.
- 11/18/98, Pensacola, FL: A worker was killed and another injured when a MCWP collapsed and fell 60' to the ground.
- 3/4/95, Miami, FL: Three workers were killed and two injured when a MCWP failed 75' in the air.
- Common deficiencies in the use of MCWPs which may contribute to a catastrophic incident, if left undetected, include:

Overloading the platform

Insufficient lateral anchorage or anchoring the mast at locations not capable of supporting the lateral loads.

Excessive gaps between the platform and the edge of the building.

Placing the platform too close to live electrical lines.

Use of damaged or corroded platform structural members.

During dismantling, removing the last anchor without providing additional stability to the mast.

Safe Work Practices

Although MCWPs, which are becoming the scaffold of choice in construction, can create safer work conditions at high levels than traditional scaffolds, safe work practices must be implemented continuously to help ensure a successful project. The following work practices should be considered whenever using MCWPs:

Daily inspections and maintenance should be conducted and documented in writing by a competent person.

Inspect the ground prior to erecting the MCWP to ensure that there are no obstacles such as holes, drop-offs, debris, ditches, or soft fill around the work platform and in the path of travel. Conduct an overhead inspection prior to erecting the MCWP to ensure the platform will not come in contact with any obstructions while moving up or down the mast (i.e. trees, balconies, overhead power lines).

- Maintain sufficient distances from electrical power lines; refer to OSHA Standard 1926.451(f)(6) for additional information.
- Extend and lock all outriggers (if equipped) prior to raising the platform.
- Ensure the mast is plumb, all guardrails are properly attached, and the “end of mast stop” system is operational
- before raising the platform.
- Only allow designed trained operators to access the platform.
- Inform all personnel on the platform before moving the platform up or down.
- Anchor the scaffold to the building or structure according to the manufacturer’s specifications.
- Never exceed the specified load capacity.
- Never alter or modify the platform.
- Do not exceed the maximum allowable tilt (as determined by the manufacturer) between two elevating units in a bridge configuration.
- When loading the platform, place loads as close as possible to the mast.
- Never install, use, or dismantle the platform in unstable weather conditions (i.e. strong winds, electrical storms, freezing rain, snow).
- Follow the manufacturer’s guidelines regarding maximum in-service wind speed conditions.
- Clean debris from the platform.
- Never use the platform as a site elevator or equipment jack.

Training

As MCWPs become ever more popular in the United States, more specialized training should be considered for users and installers. Many construction supervisors and laborers who were previously trained on traditional scaffolds will require additional training before using MCWPs.

While MCWP demand has increased and the machines are being erected on more job sites around the country, education and training on these towering structures have drastically lagged behind. Manufacturers and industry organizations are now

making a concerted effort to close that knowledge gap. Since MCWPs vary greatly among manufacturers, hands-on training provided by the manufacturer is the most effective method of training.

Regulatory

Unlike European countries, there is no federal legislation in the United States specific to the installation, inspection, maintenance, and use of MCWPs. Despite their widespread use over the last few years, OSHA has made no effort to promulgate a standard for MCWP use. Instead, the agency relies on its general duty clause 5(a)(1) and the more specific regulations it developed for older scaffolds.

California, however, has incorporated by reference the American National Standards Institute’s ANSI/SIA A92.91993 Mast-Climbing Work Platforms voluntary standard in its General Industry Safety Orders (GISO) Section 3638. The standard defines the responsibilities of mast climber dealers, owners, users, operators, lessors and lessees.

For More Information

For more information on scaffold and fall protection systems, refer to The Hartford’s Loss Control TIPS Raising Awareness About Scaffold Safety and Managing Fall Protection Hazards.

For more information, contact your local Hartford agent or your Hartford Loss Control Consultant. Visit The Hartford’s Loss Control web site at www.thehartford.com/corporate/losscontrol/

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