

DEPARTMENT OF LABOR & ECONOMIC GROWTH

DIRECTOR'S OFFICE

GENERAL INDUSTRY SAFETY STANDARDS

Filed with the Secretary of State on

These rules become effective 14 days after filing with the Secretary of State

(By authority conferred on the director of the department of labor and economic growth by sections 16 and 21 of 1974 PA 154, and Executive Reorganization Order Nos. 1996-2 and 2003-1, MCL 408.1016, 408.1021, 445.2001, and 445.2011)

R 408.10501, R 408.10502, R 408.10511, R 408.10513, R 408.10526, R 408.10528, R 408.10532, R 408.10546, R 408.10561, R 408.10565, R 408.10568, R 408.10569, R 408.10575, and R 408.10592, of the Michigan Administrative Code, are amended, and R 408.10509 is added, and R 408.10547 is rescinded as follows:

PART 5. SCAFFOLDING

R 408.10501. Scope.

Rule 501. (1) This part applies to scaffolds and the use of material and equipment in conjunction with scaffolding including a mobile elevating platform and a powered platform in, around or about places of employment. but excluding a self-propelled vehicle mounted elevating platform.

(2) Powered and manual mobile elevating platforms and self-propelled vehicle mounted elevating and rotating platforms are not included in these rules but are provided for in general industry safety standard Part 58. "Aerial Work Platforms," R 408.15801 to R 408.15842.

R 408.10502. Applicability for powered platforms.

Rule 502. (1) These rules apply to all new permanent installations for powered platforms that are completed 180 days after the effective date of these amendatory rules. **and** modifications to existing buildings that affect the structural integrity of the building exterior, tie-in guides and attachments, and the supporting structure for the powered platforms. **are considered to be new installations that are designed and completed 180 days after the effective date of these amendatory rules.**

(2) Employers shall ensure compliance with these rules for any A powered platform that is powered by a uses a power source other than electricity **shall be in compliance with these rules,** except for those rules that govern the electrical power source. The alternative power source shall **be outfitted with** provide protective devices that are equivalent to the protection that is provided by **rules pertaining to an** the electrical power source.

(3) Scaffolds that are not covered by this part shall be as safe or safer for employees as scaffolds that are regulated by these rules.

(4) Permanent installations that are completed after August 27, 1971, and installations that are in existence on, or completed before, the effective date of these amendatory rules shall be in compliance with the provisions of 29 C.F.R. §1910.66, **'Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms A** Appendix D – Existing Installations (Mandatory). These provisions are adopted in these rules by reference and are available at a cost as of the time of adoption of these rules of \$24.00, by ordering Title 29, Parts 1900 to 1910 – Part 1, Safety Standards, #869-011-00109-2, from the Superintendent of Documents, Congressional Sales Office, United States Government Printing Office, Washington, DC 20402, or from the Safety Standards Division, Michigan Department of Consumer and Industry Services, Box 30643, Lansing, Michigan 48909. In addition, the following standards that are cited in 29 C.F.R. §1910.66, appendix D, are **as follows and** adopted by reference in **R 408.40509.** these rules and are available as follows:

July 30, 2007

(a) ANSI A120.1 - 1970 **edition**, entitled "Safety Requirements for Powered Platforms for Exterior Building Maintenance." (Parts II and III), which is available from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036, or from the Michigan Department of Consumer and Industry Services, Safety Standards Division, 7150 Harris Drive, Box 30643, Lansing, Michigan 48909, at a cost as of the time of adoption of these rules of \$7.00.

(b) Subpart S, referenced in 29 C.F.R. §1910.66(c)(22)(i), means general industry safety standard Part 39 'Design Safety Standards for Electrical Systems,' R 408.13901 to R 408.13902. NFPA 70, 1971, article 610, entitled "Cranes and Hoists," which is available from the National Fire Protection Association, 1 Batterymarch Park, Box 9101, Quincy, Massachusetts 02269-9101, or from the Michigan Department of Consumer and Industry Services, Safety Standards Division, 7150 Harris Drive, Box 30643, Lansing, Michigan 48909, at a cost as of the time of adoption of these rules of \$24.50.

(c) ANSI A12.1 – 1967 edition, entitled "Safety Requirements for Floor and Wall Openings, Railings and Toeboard."

R 408.10509. Adoption of standards by reference; access to other MIOSHA rules.

Rule 509. (1) The standards specified in this rule, except for the standards specified in subrule (2) of this rule, are adopted in these rules by reference.

(a) The following standards are available from IHS/Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado, 80112, USA, telephone number: 1-800-854-7179 or via the internet at web-site: <http://global.ihs.com>; at a cost as of the time of adoption of these rules, as stated in this subrule:

(i) American National Society Institute Standard ANSI A120.1 'Safety Requirement for Powered Platforms for Exterior Building Maintenance,' 1970 edition, also known as American Society of Mechanical Engineers Standard ASME A120.1 'Safety Requirements Powered Platforms and Traveling Ladders and Gantries for Building Maintenance,' 1970 edition. Cost \$20.00

(ii) American National Society Institute Standard ANSI A12.1 'Safety Requirements for Floor and Wall Openings, Railings and Toeboard,' 1967 edition. Cost \$20.00.

(b) The Code of Federal Regulations, Title 29, Occupational Safety And Health Standard 1910.66 "Powered Platforms, Manlifts, And Vehicle-Mounted Work Platforms," Appendix D "Existing Installations (Mandatory)" is available from the U.S. Government Printing Office, Washington DC, 20402; telephone number (202) 512-1800 or through the GPO website - <http://bookstore.gpo.gov>. Cost. \$11.00.

(c) The standards adopted in subrule 1(a) and (b) of this rule are also available for inspection at the Department of Labor and Economic Growth, MIOSHA Standards Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143.

(d) Copies of the standards adopted in subrule (1)(a) and (b) of this rule may be obtained from the publisher or may also be obtained from the Department of Labor and Economic Growth, MIOSHA Standards Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143, at the cost charged in subrule (1)(a) and (b), of this rule, plus \$20 for shipping and handling.

(2) The following Michigan Occupational Safety and Health Standards are referenced in these rules. Up to 5 copies of these standards may be obtained at no charge from the Michigan Department of Labor and Economic Growth, MIOSHA Standards Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143 or via the internet at web-site: www.michigan.gov/mioshastandards. For quantities greater than 5, the cost, as of the time of adoption of these rules, is 4 cents per page.

(a) General Industry Safety Standard Part 2. Floor and Wall Openings, Stairways and Skylights, R 408.10201 to R 408.10241.

(b) General Industry Safety Standard Part 3. Fixed Ladders, R 408.10301 to R 408.10372.

(c) General Industry Safety Standard Part 4. Portable Ladders, R 408.10401 to R 408.10456.

(d) General Industry Safety Standard Part 7. Guards for Power Transmission, R 408.10701 to R 408.10765.

(e) General Industry Safety Standard Part 8. Portable Fire Extinguishers, R 408.10801 to R 408.10839.

(f) General Industry Safety Standard Part 21. Powered Industrial Trucks, R 408.12101 to R 408.12193.

(g) General Industry Safety Standard Part 33. Personal Protective Equipment, R 408.13301 to R 408.13398.

(h) General Industry Safety Standard Part 39. Design Safety Standards for Electrical Systems, R 408.13901 to R 408.13902.

(i) General Industry Safety Standard Part 58. Aerial Work Platforms, R 408.15801 to R 408.15842.

R 408.10511. General requirements.

Rule 511. (1) When required by this part, a safety belt, lanyard, and lifeline shall be provided to employees and used as prescribed in General Industry Safety Standard Part 33. "Personal Protective Equipment," being R 408.13301 to R 408.13398, et seq. of the Michigan Administrative Code.

(2) Except where a ladder, as prescribed in General Industry Safety Standard Part 4. "Portable Ladders," being R 408.10401 to R 408.10456, of the Michigan Administrative Code, or a self-propelled vehicle mounted elevating platform is furnished, an employee engaged in work that cannot be done safely from the ground or from solid construction shall be provided a scaffold from which to work or shall wear a safety harness and lifeline.

(3) A scaffold, part, or material used in scaffolding shall not be furnished or used if it has a defect, which would create a hazard to an employee. A scaffold damaged or weakened from any cause shall be repaired before use.

(4) A scaffold shall not be loaded to more than the designed working load.

(5) Materials being hoisted to a scaffold shall have a tag line when necessary to control the load.

(6) Tools, materials, and debris shall not be permitted to accumulate in a quantity to cause a hazard.

(7) Precautions shall be taken to protect scaffold members, including suspension ropes, when using a heat producing process.

(8) A lifeline and safety belt shall be used where an employee is required to crawl out on a thrust out or projecting beam.

(9) An employer shall not permit an employee ~~shall not be permitted~~ to work on a scaffold outdoors during a storm or high wind, or on a scaffold covered with ice or snow, except when performing emergency service. When performing emergency service, safeguards such as, but not limited to, lanyards and safety belts shall be used by the employee.

(10) Scaffolding endangered by a truck or other moving equipment shall be protected by a warning device, or barrier, or both.

(11) A scaffold shall not be altered or moved horizontally while it is in use or is being occupied unless the scaffold is specifically designed for occupied horizontal travel.

(12) Fiber rope used for or near any work involving the use of corrosive substances or chemicals shall be treated or protected against deterioration.

R 408.10513. Construction.

Rule 513. (1) A scaffold and its components shall have a designed safety factor of not less than 4 with the load figure including the total weight of materials, men, and scaffold. Load-carrying timber members for scaffold framing shall be not less than 1500 fiber, stress grade, construction grade lumber.

(2) A scaffold, except a ladder scaffold, boatswain's chair, or needle beam scaffold, 10 feet or more above floor or ground level, shall have a standard barrier and toeboard pursuant to rules R 408.10231 and R 408.10233 of General Industry Safety Standard Part 2. "Floor and Wall Openings, Stairways, and Skylights." being R 408.10231 and R 408.10233, of the Michigan

~~Administrative Code.~~ A life line and safety belt shall be used where a railing is required but not practical.

(3) A scaffold over a walk, aisle, or work area shall have the sides screened from toeboard to the top rail where an employee is required to work or pass under the scaffold.

(4) When work is being performed above a scaffold, overhead protection consisting of 2 inch planks laid tight, or equivalent material, shall be installed not more than 9 feet above the scaffold floor.

(5) Where access is not available directly from a structure, a wood scaffolding shall have a stair to the platform or portable ladder pursuant to **General Industry Safety Standards** Part 4. "Portable ladders," R 408.10401 to **R 408.104560** ~~R 408.10456~~, of the Michigan Administrative Code, or a fixed ladder pursuant to Part 3. "Fixed Ladders," ~~being~~ R 408.10301 to **R 408.10456**, ~~R 408.10365~~, of the Michigan Administrative Code, except that a cage is not mandatory for the fixed ladder. Use of a stair or fixed ladder shall not have a tendency to tip the scaffold.

(6) Manufactured scaffolding shall be equipped with a stair or a fixed ladder, mounted by a portable ladder, except that a cage is not mandatory for a fixed ladder. On manufactured scaffolding purchased after November 16, 1974, and equipped with a built-in fixed ladder or an attached scaffold ladder, the ladder shall be constructed of rungs not less than 12 inches long, uniformly spaced not less than 12 inches nor more than 16 1/2 inches from the center of 1 rung to another and the rung and component parts shall support a minimum of 300 pounds.

(7) Instead of the requirements for a stair, fixed ladder, or portable ladder, the intermediate horizontal members of a frame of a manufactured tubular welded frame scaffold may be used for access to, and egress from, the work platform if all of the following conditions are met:

(a) All frames and component parts are compatible in design.

(b) The intermediate horizontal members of a frame are a minimum of 16 inches in length.

(c) The horizontal members of each frame shall be uniformly spaced and shall not exceed 17 inches center to center vertically.

(d) When frames are connected vertically to one another, the distance between the bottom horizontal member of the upper end frame and the top horizontal member of the lower end frame shall be within 3 inches of the uniform spacing of the horizontal members of each frame.

(e) The elevation to the lowest horizontal member of the bottom frame shall not exceed 21 inches from ground or floor.

(f) Each horizontal member shall be capable of supporting 300 pounds applied at the member's midpoint without bending or cracking.

(g) Each horizontal member shall be inspected for, and found free of cracks, bends, or bad welds.

(h) The guardrail system located on the side where horizontal members of the scaffold frame are used for access to or egress from, a work platform shall be constructed as follows:

(i) The intermediate rail shall be omitted between the corner posts at access location.

(ii) The top rail shall be continuous between posts.

(iii) Only 1 employee at a time shall use a horizontal member of a frame as access to, or egress from, the workstation.

(8) Footing for a scaffold shall be sound, rigid, and capable of supporting the maximum intended load without settling or displacement. Objects such as barrels, boxes, loose brick, or concrete blocks shall not be used.

(9) Poles, legs, or uprights of a scaffold shall be plumb and shall be secured or braced to prevent swaying or displacement.

(10) Load-carrying timber members of a scaffold shall be a minimum of 1500 fiber, stress grade, construction grade lumber.

(11) Construction and attachment of a scaffold shall be such that there is no direct pull on the fasteners.

R 408.10526. Outrigger's scaffolds.

Rule 526. (1) A thrustout for an outrigger scaffold shall be of timber 3 by 10 inches nominal, set on edge, or of structural steel of equal strength set with the web vertical. A thrustout shall extend outside the building not more than 6 feet, shall be spaced **not** ~~be~~ more than on 6 foot centers,

and shall be fastened to prevent twisting or other movement. A thrustout shall be braced diagonally from the outside end to the building. The brace shall be not less than 25% longer than the extended length of the thrustout. The inboard end of outrigger beams, measured from the fulcrum point to the extreme point of support, shall be not less than 1 1/2 times the outboard end in length.

(2) A suspended platform shall be formed by use of 2 by 6 inch nominal vertical hangers and 2 by 6 inch nominal bearers. A vertical hanger shall be braced to prevent side sway and be not more than 10 feet long. Additional support blocks shall be nailed to the vertical hangers above the thrustouts and below the bearers. The inboard ends of outrigger beams shall be securely supported, either by means of struts bearing against sills in contact with the overhead beams or ceiling, or by means of tension members secured to the floor joist underfoot, or by both if necessary. The inboard ends of outrigger beams shall be secured against tipping, and the entire supporting structure shall be securely braced in both directions to prevent any horizontal movement.

(3) Planking for the platform shall abut edges tightly from end of thrustout to building or from vertical hanger to vertical hanger, and shall be as prescribed in ~~rule~~ **R 408.10512**.

(4) A standard barrier and toeboard shall be installed as prescribed in ~~rule~~ **R 408.10231** and **R 408.10233** of general industry safety standards-commission standard Part 2. "Floor and Wall Openings, Stairways and Skylights."

(5) A horse scaffold shall not be used with an outrigger's scaffold.

(6) Outrigger scaffolds designed by a registered professional mechanical or civil engineer shall be constructed and erected in accordance with such design. A copy of the detailed drawings and specifications, showing the sizes and spacing of members, shall be kept on the job. Where additional working levels are required to be supported by the outrigger method, the plans and specifications of the outrigger and scaffolding structure shall be designed by a registered professional mechanical or civil engineer.

R 408.10528. Ladder jack scaffolds.

Rule 528. (1) A ladder jack scaffold shall be used on a Type 1, sometimes-called heavy duty, manufactured ladder only, and at heights not more than 20 feet from the ground or floor level.

(2) The span of a wood plank shall be not more than 8 feet between ladder jacks, and the planking shall be as prescribed in ~~rule~~ **R 408.10512**.

(3) The span of a pick shall not exceed 24 feet.

(4) A ladder jack scaffold, shall be limited to 2 employees at any 1 time, except if 3 ladders support the plank 3 employees may occupy the plank. Not more than 2 employees shall occupy any given 8 feet of plank at any 1 time.

(5) A ladder used with a ladder jack shall be equipped with nonslip feet pursuant to ~~rule~~ **R 108.10447** of the general industry safety standards-commission standard, Part 4. "Portable Ladders," **R 408.10401 to R 408.10456**.

(6) A ladder jack shall be made of metal with a designed strength to sustain the load as prescribed in subrule (1) of ~~rule~~ **R 408.10513**. A ladder jack shall be designed to bear on the side rails in addition to the rungs, or if bearing on the rungs only, the bearing surface shall be not less than 10 lineal inches on each rung.

R 408.10532. Working surfaces; steep slopes.

Rule 532. (1) An employee working on a roof where the working area is more than 20 feet above the ground, the pitch is more than 3 inches in 12 inches, and there is no roof parapet, shall be provided and use a roofing bracket scaffold or crawling board.

(2) An employee using a roofing bracket scaffold or crawling board shall use a safety belt and lifeline or a catch platform shall be provided. The catch platform shall extend 2 feet beyond the projection of the eaves or structure, whichever is **farther** ~~further~~ away, and shall be equipped with a standard barrier and toeboard as prescribed in ~~rules~~ **R 408.10231** and **R 408.10233** of **general industry safety standard** Part 2. "Floor and Wall Openings, Stairways, and Skylights." ~~being R 408.10231 and R 408.10233 of the Michigan Administrative Code.~~

R 408.10546. Powered **and manual** mobile elevating platforms.

Rule 546. (a) ~~A~~ Powered **and manual** mobile elevating platforms shall be operated as prescribed in general industry safety standard, Part 58. "Aerial Work Platforms," R 408.15801 to R 408.15842.

(b) ~~excluding A~~ Powered industrial trucks shall be operated as prescribed in general industry safety standard, Part 21. "Powered Industrial Trucks," R 408.12101 to R 408.12193.

- ~~(a) Be used according to the manufacturer's written instructions which shall be kept on the premises.~~
- ~~(b) Provide standard barrier and toeboard pursuant to rules 231 and 233 of the general industry safety standards commission standard, part 2. Floor and Wall Openings, Stairways and Skylights.~~
- ~~(c) Have a designed safety factor of not less than 4 for the lifting device and platform.~~
- ~~(d) Have a designed safety factor of not less than 6 for all cables.~~
- ~~(e) Have a positive safety device to prevent the platform from controlled descent in case of power failure or failure of the elevating system.~~
- ~~(f) Be visually inspected by the operator before each use for defects that are hazardous and not be used until the defective part is repaired or replaced.~~
- ~~(g) Not be ridden when moving horizontally, except where specifically designed for that purpose.~~
- ~~(h) Not exceed a height of 4 times the minimum base dimension where the stability of the scaffold is dependent on the base dimension, or shall be guyed every 20 feet of height to prevent movement. Outriggers, when used, may be considered as a part of the base dimension.~~
- ~~(i) Have the wheels locked when in use.~~
- ~~(j) Have the hoisting motor pursuant to rules 548 or 549.~~
- ~~(k) Have the base enclosed where the cables or a pinch point constitutes a hazard to an employee.~~

R 408.10547. **Rescinded.** Manual mobile elevating platforms.

- ~~Rule 547. (1) A manually powered mobile elevating platform shall equipped with a positive locking device to prevent horizontal movement.~~
- ~~(2) A manually powered mobile elevating platform shall comply with all items in rule 546 except subdivision (j).~~

R 408.10561. Construction and modification; requirements for buildings utilizing working platforms for maintenance; tie-in guides.

Rule 561. (1) A powered platform installed, or that part of a powered platform modified, after August 27, 1971, shall be in compliance with the design and manufacturing requirements prescribed in ANSI **ASME** standard A120.1, 1970 **edition**, 'Safety requirements for powered platforms for exterior building maintenance, which is adopted in **R 408.10509** these rules by reference, and as further prescribed in the rules of this part. ~~The standard is available for inspection at the Lansing office of the department of consumer and industry services. This standard may be purchased from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036, or from the Michigan Department of Consumer and Industry Services, 7150 Harris Drive, Box 30643, Lansing, Michigan 48909, at a cost as of the time of adoption of these rules of \$7.00 each.~~

(2) The following requirements apply to affected parts of buildings that utilize working platforms for building maintenance:

- (a) Structural supports, tie-downs, tie-in guides, anchoring devices, and any affected parts of the building that are included in the installation shall be designed by, or under the direction of, a registered professional engineer who is experienced in such design.
- (b) Exterior installations shall be capable of withstanding prevailing climatic conditions.
- (c) The building installation shall provide safe access to, and egress from, the equipment and shall provide sufficient space to conduct necessary maintenance of the equipment.
- (d) The affected parts of the building shall have the capability of sustaining all of the loads imposed by the equipment.
- (e) The affected parts of the building shall be designed to allow the equipment to be used without exposing employees to a hazardous condition.

(3) The exterior of each building shall be provided with tie-in guides unless the conditions specified in either of the following provisions are met:

(a) Tie-in guides required pursuant to this rule may be eliminated for not more than 75 feet (22.9 m) of the uppermost elevation of the building if angulated roping is employed, if the use of tie-in guides is not feasible due to the exterior building design, and if an angulation force of not less than 10 pounds (44.4 n) is maintained under all conditions of loading.

(b) Tie-in guides may be eliminated if 1 of the specified guide systems is provided as specified in R 408.10562 and R 408.10563.

R 408.10565. Roof cars; carriages; suspension methods.

Rule 565. (1) A roof car shall be used when it is necessary to move a working platform horizontally to a work or storage position.

(2) Movements of a roof car shall be restricted to a designated path of travel. Mechanical stops shall be provided and shall prevent the roof car from traversing outside the intended path of travel. The stops shall be capable of withstanding a force equal to 100% of the inertial effect of the roof car under power and shall be designed to prevent a crushing or shearing hazard.

(3) Elevated building maintenance equipment shall be suspended by a roof car, carriage, outrigger, davits, or an equivalent method.

(4) Carriages or roof cars shall be in compliance with all of the following provisions:

(a) The horizontal movement of a carriage shall be controlled to ensure its safe movement and allow accurate positioning of the platform for vertical travel or storage.

(b) Powered carriages shall not exceed a traversing speed of 50 feet per minute (0.3 m/s).

(c) The initiation of a traversing movement for a manually propelled carriage on a smooth level surface shall not require a person to exert a horizontal force of more than 40 pounds (444.8 n).

(d) Structural stops and curbs shall be provided to prevent the traversing of the carriage beyond its designed limits of travel.

(e) Traversing controls for a powered carriage shall be of a continuous pressure weatherproof type. Multiple controls, when provided, shall be arranged to permit operation from only 1 control station at a time. An emergency stop device shall be provided on each end of a powered carriage for interrupting power to the carriage drive motors.

(f) The operating control or controls shall be connected so that, in the case of suspended equipment, traversing of a carriage is not possible until the suspended portion of the equipment is located at its uppermost designed position for traversing and is free of contact with the face of the building or building guides. All protective devices and interlocks shall be in the proper position to allow traversing of the carriage.

(g) Stability for underfoot supported carriages shall be obtained by gravity, by an attachment to a structural support, or by a combination of gravity and a structural support. The use of flowing counterweights to achieve stability is prohibited.

(h) The stability factor against overturning shall not be less than 5 for horizontal traversing of the carriage, including the effects of impact and wind.

(i) The carriages and their anchorages shall be capable of resisting accidental overtensioning of the wire ropes that suspend the working platform, and this calculated value shall include the effect of 1-112 times the stall capacity of the hoist motor. The forces that result from the stall load of the hoist and 112 of the wind load shall not cause damage to any part of the installation.

(j) Roof carriages that rely on having tie-down devices secured to the building to develop the required stability against overturning shall be provided with an interlock that will prevent vertical platform movement unless the tie-down is engaged.

(k) An automatically applied braking or locking system, or an equivalent, shall be provided that will prevent the unintentional traversing of power-traversed or power-assisted carriages.

(l) A manual or automatic braking or locking system, or an equivalent, shall be provided that will prevent the unintentional traversing of manually propelled carriages.

(m) A means to lock out the power supply for the carriage shall be provided.

(n) Safe access to, and egress from, the carriage shall be provided from a safe surface. If the carriage traverses an elevated area, any operating area on the carriage shall be protected by a guardrail system in compliance with general industry **safety** standard Part 2. "Floor and Wall Openings, Stairways, and Skylights," being R 408.10201 to R 408.10241. ~~et seq. of the~~

~~Michigan Administrative Code.~~ Any access gate shall be self-closing and self-latching or shall be provided with an interlock.

(o) Each carriage work station position shall be identified by location markings or position indicators, or both.

(p) A motor shall stall if the load on the hoist motor is at any time more than 3 times that necessary for lifting the working platform with its rated load.

R 408.10568. Perimeter guarding; equipment stops; maintenance access: elevated track system walkway and guardrail system; platform access and egress safety; certain anchors, fasteners, and structures to be corrosion resistant; cable installation; emergency action plan; repairs or major maintenance to parts of building providing primary support.

Rule 568. (1) Employees who work on roofs while performing building maintenance shall be protected by a perimeter guarding system that meets the requirements of general industry safety standard, Part 2. "Floor and Wall Openings, Stairways, and Skylights," ~~being R 408.10201~~ **to R 408.10241.** ~~et seq. of the Michigan Administrative Code.~~

(2) The perimeter guard shall not be more than 6 inches (152 mm) inboard of the inside face of a barrier, for example, the parapet wall, or roof edge curb of the building being serviced; however, the perimeter guard location shall not be set back more than 18 inches (457 mm) from the exterior building face.

(3) Operational areas for trackless type equipment shall be provided with structural stops, such as curbs, to prevent equipment from traveling outside its intended travel areas and to prevent a crushing or shearing hazard.

(4) Means shall be provided to traverse all carriages and their suspended equipment to a safe area for maintenance and storage. Maintenance shall be performed on equipment in a stored position when possible.

(5) An elevated track system which is located 4 feet (1.2 m) or more above a safe surface and which is traversed by carriage supported equipment shall be provided with a walkway and guardrail system or else the working platform shall be capable of being lowered, as part of its normal operation, to the lower safe surface for access and egress of the personnel and shall be provided with a safe means of access and egress to the lower safe surface.

(6) Imbedded tie-down anchors, fasteners, and affected structures shall be resistant to corrosion.

(7) Hanging lifelines and all cables that are not in tension shall be stabilized at 200-foot (61 m) intervals of vertical travel of the working platform beyond an initial 200-foot (61 m) distance.

(8) Hanging cables, other than suspended wire ropes, that are in constant tension shall be stabilized when the vertical travel is more than an initial 600-foot (183 m) distance. Beyond the initial 600 feet, cables shall be stabilized at intervals of 600 feet (183 m) or less.

(9) A written emergency action plan shall be developed and implemented for each kind of working platform operation. This plan shall explain the emergency procedures that are to be followed in the event of a power failure, equipment failure, or other emergencies which may be encountered. The plan shall include building emergency escape routes, procedures, and alarm systems to be used by each employee before operating a platform. Upon initial assignment and when the plan is changed, the employer shall review, with each employee, those parts of the plan that the employee is required to know in the event of an emergency.

(10) Repairs or major maintenance of those building portions that provide primary support for the suspended equipment shall not affect the capability of the building to be in compliance with the requirements of these rules.

R 408.10569. Electrical requirements.

Rule 569. The following electrical requirements apply to buildings that utilize working platforms for building maintenance:

(a) General building electrical installations shall be in compliance with the provisions of general industry safety standard **Part 39. Design Safety Standards for Electrical Systems.** ~~4910.309 'National Electrical Code,' 1971, as adopted by reference pursuant to the provisions of section 14 of Act No. 154 of the Public Acts of 1974, as amended, being §408.1014 of the Michigan Compiled Laws, unless otherwise specified in these rules. This standard is available from the~~

~~Safety Standards Division, Michigan Department of Consumer and Industry Services, 7150 Harris Drive, Lansing, Michigan 48909, at no charge as of the time of adoption of these rules.~~

(b) Building electrical wiring shall be of such capacity that when a full load is applied to the equipment power circuit not more than a 5% drop from building service-vault voltage shall occur at any power circuit outlet that is used by equipment regulated by these rules.

(c) The equipment power circuit shall be an independent electrical circuit that shall remain separate from all other equipment within or on the building, other than power circuits that are used for hand tools which will be used in conjunction with the equipment. If the building has an emergency power system, the equipment power circuit may also be connected to this system.

(d) The power circuit shall be provided with a disconnect switch that can be locked in the "off" or "on" position. The switch shall be located to allow the operators of the equipment access to the switch.

(e) The disconnect switch for the power circuit shall be locked in the "on" position when the equipment is in use.

R 408.10575. Hoisting machines; suspended equipment; 2 and 4-point suspended working platforms; single-point suspended platforms; ground-rigged working platforms; intermittently stabilized platforms; button-guide stabilized platforms; supported equipment; suspension wire ropes and rope connections.

Rule 575. (1) The raising and lowering of suspended or supported equipment shall be performed only by a hoisting machine.

(2) Each hoisting machine shall be capable of arresting any overspeed descent of the load.

(3) Each hoisting machine shall be powered only by air, electric, or hydraulic sources.

(4) Each hoisting machine shall be capable of raising or lowering 125% of the rated load of the hoist.

(5) Moving parts of a hoisting machine shall be enclosed or guarded in compliance with the provisions of general industry **safety** standard, Part 7. "Guards for Power Transmission," being R 408.10701 **to R 408.10765.** ~~et seq. of the Michigan Administrative Code.~~

(6) Flammable liquids shall not be carried on the working platform.

(7) Winding drums, traction drums, and sheaves and directional sheaves that are used in conjunction with hoisting machines shall be sized for the wire rope that is used.

(8) Each winding drum shall be provided with a positive means of attaching the wire rope to the drum. The attachment shall be capable of developing not less than 4 times the rated load of the hoist.

(9) Each hoisting machine shall be provided with a primary brake and at least 1 independent secondary brake, each of which shall be capable of stopping and holding not less than 125% of the lifting capacity of the hoist. The primary brake shall be directly connected to the drivetrain of the hoisting machine and shall not be connected through belts, chains, clutches, or set screw-type devices. The brake shall automatically set when power to the prime mover is interrupted. The secondary brake shall be an automatic emergency type of brake that, if actuated during each stopping cycle, shall not engage before the hoist is stopped by the primary brake and shall stop and hold the platform within a vertical distance of 24 inches (609.6 mm).

(10) Any component of a hoisting machine that requires lubrication for its protection and proper functioning shall be provided with a means for that lubrication to be applied.

(11) All of the following provisions apply to suspended equipment:

(a) Each suspended unit component, except for suspension ropes and guardrail systems, shall be capable of supporting not less than 4 times the maximum intended live load applied or transmitted to that component.

(b) Each suspended unit component shall be constructed of materials that will withstand anticipated weather conditions.

(c) Each suspended unit shall be provided with a load rating plate which is conspicuously located and which states the unit weight and rated load of the suspended unit.

(d) When the suspension points on a suspended unit are not at the unit ends, the unit shall be capable of remaining continuously stable under all conditions of use and position of the live load and shall maintain not less than a 1.5 to 1 stability factor against unit upset.

(e) Guide rollers, guide shoes, or building face rollers shall be provided and shall compensate for variations in building dimensions and for minor horizontal out-of-level variations of each suspended unit.

(f) Each working platform of a suspended unit shall be secured to the building facade by 1 or more of the following methods or by an equivalent method that is in compliance with the provisions of R 408.10561 and R 408.10562:

- (i) Continuous.
- (ii) Intermittent.
- (iii) Button guide engagement.
- (iv) Angulated roping.
- (v) Building face rollers.

(g) Each working platform of a suspended unit shall be provided with a guardrail system on all sides, which shall meet the requirements of general industry **safety** standard, Part 2. "Floor and Wall Openings, Stairways, and Skylights," ~~being R 408.10201~~ **to R 408.10241**, ~~et seq. of the Michigan Administrative Code.~~ All of the following provisions apply to the guardrail system:

- (i) The system shall consist of a top guardrail, midrail, and toeboard.
- (ii) The top guardrail shall be not less than 42 inches high and shall be able to withstand not less than a 200- pound force in any downward or outward direction.
- (iii) The midrail shall be able to withstand not less than a 75-pound (333 n) force in any direction.
- (iv) The areas between the guardrail and toeboard on the ends and outboard side, and the area between the midrail and toeboard on the inboard side, shall be closed with a material that is capable of withstanding a load of 100 pounds (45.4 kg.) applied horizontally over any area of 1 square foot (.09 m²). All openings in the material shall be small enough to prevent the passage of lifelines and potential falling objects that may be hazardous to persons below.
- (v) Toeboards shall be capable of withstanding a force of not less than 50 pounds (222 n) applied in any direction at any point along the toeboard.
- (vi) Toeboards shall be not less than 4 inches in height from the top edge to the level of the platform floor.
- (vii) Toeboards shall be securely fastened in place at the outermost edge of the platform and have not more than 1/4 of an inch (1.3 cm) clearance above the platform.
- (viii) Toeboards shall be solid or have an opening that is not more than 1 inch (2.5 cm) in the greatest dimension.

(12) All of the following provisions apply to a 2 and 4-point suspended working platform:

- (a) The working platform shall be not less than 24 inches (610 mm) wide and shall be provided with a minimum of a 12-inch (305 mm) wide passage at or past any obstruction on the platform.
- (b) The flooring shall be of a slip-resistant type and shall not have an opening that would allow the passage of lifelines, cables, and other potential falling objects.
- (c) The working platform shall be provided with a means of suspension that will restrict the platform from tilting more than 15 degrees in any direction.
- (d) Any cable that is suspended from above the platform shall be provided with a means for storage to prevent accumulation of the cable on the floor of the platform.
- (e) All operating controls for the vertical travel of the platform shall be of the continuous-pressure type and shall be located on the platform.
- (f) Each operating station of every working platform shall be provided with a means of interrupting the power supply to all hoist motors to stop any further powered ascent or descent of the platform.
- (g) The maximum rated speed of the platform shall not be more than 50 feet per minute (0.3 ms) for single-speed hoists and not more than 75 feet per minute (0.4 ms) for multispeed hoists.
- (h) All tools, water tanks, and other accessories shall be secured to prevent their movement or accumulation on the floor of the platform.
- (i) Portable fire extinguishers that are in compliance with the provisions of general industry safety standard, Part 8. "Portable Fire Extinguishers," ~~being R 408.10801~~ **to R 408.10839**, ~~et seq. of the Michigan Administrative Code,~~ shall be provided and securely attached on all working platforms.
- (j) Access to and egress from a working platform, except for those that land directly on a safe surface, shall be provided by stairs, ladders, platforms, and runways that are in compliance with

the provisions of general industry **safety standards**, Part 2. "Floor and Wall Openings, Stairways, and Skylights," being R 408.10201 **to R 408.10241**, ~~et seq.~~, and Part 4. "Portable Ladders," being R 408.10401 **to R 408.10456**, ~~et seq.~~ of the Michigan Administrative Code. Access gates shall be self-closing and self-latching.

(k) Means of access to or egress from a working platform that is 48 inches (1.2 m) or more above a safe surface shall be provided with a guardrail system or ladder-handrails that are in compliance with the provisions of general industry **safety standards**, Part 2. "Floor and Wall Openings, Stairways, and Skylights," being R 408.10201 **to R 408.10241**, ~~et seq.~~ and Part 4. "Portable Ladders," being R 408.10401 **to R 408.10456**, ~~et seq.~~ of the Michigan Administrative Code.

(l) The platform shall be provided with a secondary wire rope suspension system if the platform has overhead structures that restrict the emergency egress of employees. A horizontal lifeline or a direct connection anchorage shall be provided as part of a fall arrest system. The system shall be in compliance with the requirements of **general industry safety standard** Part 33. "Personal Protective Equipment," being R 408.10331 **to R 408.13398**, ~~et seq.~~ of the Michigan Administrative Code.

(m) A vertical lifeline shall be provided as part of a fall arrest system. The system shall be in compliance with the requirements of **general industry safety standard** Part 33. "Personal Protective Equipment," being R 408.10331 **to R 408.10398**, ~~et seq.~~ of the Michigan Administrative Code, for each employee on a working platform that is suspended by 2 or more wire ropes if the failure of 1 wire rope or suspension attachment will cause the platform to upset. If a secondary wire rope suspension is used, vertical lifelines are still required for the fall arrest system.

(n) An emergency electric operating device shall be provided on roof-powered platforms near the hoisting machine for use in the event of failure of the normal operating device that is located on the working platform or failure of the cable that is connected to the platform. The emergency electric operating device shall be mounted in a secured compartment and the compartment shall be labeled with instructions for use. A means for opening the compartment shall be mounted on a break-glass receptacle that is located near the emergency electric operating device or in an equivalent secure accessible location.

(13) Both of the following provisions apply to a single-suspended working platform:

(a) The requirements of R 408.10575(12)(a) **to thru** (k) shall also apply to a single-point working platform.

(b) Each single-point suspended working platform shall be provided with a secondary wire rope suspension system that will prevent the working platform from falling if there is a failure of the primary means of support or if the platform contains overhead structures that restrict the egress of the employees. A horizontal lifeline or a direct connection anchorage that meets the requirements of appendix c shall be provided, as part of a fall arrest system that is in compliance with the requirements of **general industry safety standard** Part 33. "Personal Protective Equipment," being R 408.13301 **to R 408.13398**, ~~et seq.~~ of the Michigan Administrative Code, for each employee on the platform.

(14) Both of the following provisions apply to a ground-rigged working platform:

(a) The working platform shall be in compliance with all of the requirements of R 408.10575(12)(a) **to thru** (k).

(b) After each day's use, the power supply within the building shall be disconnected from a ground-rigged working platform, and the platform shall be either disengaged from its suspension points or secured and stored at grade.

(15) All of the following provisions apply to an intermittently stabilized platform:

(a) The platform shall be in compliance with the requirements of R 408.10575(12)(a) **to thru** (m).

(b) Each stabilizer tie shall be equipped with a quick-connect/quick-disconnect device which cannot be accidentally disengaged, which is for attachment to the building anchor, and which is resistant to adverse environmental conditions.

(c) The platform shall be provided with a stopping device that will interrupt the hoist power supply if the platform contacts a stabilizer tie during its ascent.

(d) Building face rollers shall not be placed at the anchor setting if exterior anchors are used on the building face.

(e) Stabilizer ties that are used on intermittently stabilized platforms shall allow for the specific attachment length that is needed to effect the predetermined angulation of the suspended wire rope. The specific attachment length shall be maintained at all building anchor locations.

(f) The platform shall be in continuous contact with the face of the building during ascent and descent.

(g) The attachment and removal of stabilizer ties shall not require the horizontal movement of the platform.

(h) The platform-mounted equipment and its suspension wire ropes shall not be physically damaged by the loads from the stabilizer tie or its building anchor. The platform, platform-mounted equipment, and wire ropes shall be able to withstand a load that is not less than twice the ultimate strength of the stabilizer tie.

(16) All of the following provisions apply to a button-guide stabilized platform:

(a) The platform shall be in compliance with the requirements of R 408.10575(12)(a) ~~to thru~~ (m).

(b) Each guide track on the platform shall engage a minimum of 2 guide buttons during any vertical travel of the platform after the initial button engagement.

(c) Each guide track on a platform that is part of a roof-rigged system shall be provided with a storage position on the platform.

(d) Each guide track on the platform shall be sufficiently maneuverable by platform occupants to permit easy engagement of the guide buttons and easy movement into and out of the guide track's storage position on the platform.

(e) Two guide tracks shall be mounted on the platform and shall provide continuous contact with the building face.

(f) The load-carrying components of the button guide stabilization system that transmit the load into the platform shall be capable of supporting the weight of the platform or provision shall be made in the guide track connectors or platform attachments to prevent the weight of the platform from being transmitted to the platform attachments.

(17) All of the following provisions apply to supported equipment:

(a) Supported equipment shall maintain a vertical position in respect to the face of the building by means other than friction.

(b) Cog wheels or equivalent means shall be incorporated to provide climbing traction between the supported equipment and the building guides. Additional guide wheels or shoes shall be incorporated as may be necessary to ensure that the drive wheels are continuously held in positive engagement with the building guides.

(c) Launch guide mullions which are indexed to the building guides and which are retained in alignment with the building guides shall be used to align drive wheels that enter the building guides.

(d) Manned platforms that are used on supported equipment shall be in compliance with the requirements of R 408.10575(12)(a), (b), and (d) ~~to thru~~ (k) with respect to suspended equipment.

(18) All of the following provisions apply to suspension wire ropes and rope connections:

(a) Each specific installation shall use suspension wire ropes or combination cable and connections that are in compliance with the specifications recommended by the manufacturer of the hoisting machine that is used. Connections shall be capable of developing not less than 80% of the rated breaking strength of the wire rope.

(b) Each suspension rope shall have a design factor of not less than 10. The design factor is the ratio of the rated strength of the suspension wire rope to the rated working load and shall be calculated using the following formula:

$$f = \frac{S(n)}{W}$$

where:

f = design factor

S = manufacturer's rated strength of 1 suspension rope.

n = number of suspension ropes under 1 load

W = rated working load on all ropes at any point of travel.

(c) Suspension wire rope grade shall be at least improved plow steel or equivalent.

(d) Suspension wire ropes shall be sized to be in compliance with the required design factor, but shall not be less than 5/16 of an inch (7.94 mm) in diameter.

- (e) A reverse bend in wire rope shall not be permitted.
- (f) A bend radius in wire rope shall not be less than 20 times the wire rope diameter.
- (g) Wire rope shall be inspected and maintained as specified in the provisions of R 408.10582.

R 408.10592. Personal fall protection.

Rule 592. Employees on working platforms shall be protected by a personal fall arrest system that is in compliance with the requirements of general industry safety standard Part 33. "Personal Protective Equipment," being R 408.13301 **to R 408.13398.** ~~et seq. of the Michigan Administrative Code.~~