

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

DIRECTOR'S OFFICE

CONSTRUCTION SAFETY STANDARDS

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These rules become effective immediately upon filing with the Secretary of State unless adopted under section 33, 44, or 45a(6) of 1969 PA 306.

Rules adopted under these sections become effective 7 days after filing with the Secretary of State.

(By authority conferred on the director of the department of licensing and regulatory affairs by sections 19 and 21 of 1974 PA 154, **MCL 408.1019 and 408.1021**, and Executive Reorganization Order Nos. 1996-2, 2003-1, 2008-4, and 2011-4, MCL, 445.2001, 445.2011, 445.2025 and 445.2030)

R 408.42605, R 408.42608, R 408.42609, R 408.42626, R 408.42629, R 408.42643, R 408.42651, and R 408.42655 of the Michigan Administrative Code are amended as follows:

PART 26. STEEL ERECTION

R 408.42605 Definitions; D to M.

Rule 2605. (1) "Decking hole" means a gap or void more than 2 inches (5.1 cm) in its least dimension and less than 12 inches (30.5 cm) in its greatest dimension in a floor, roof, or other walking/working surface. Pre-engineered holes in cellular decking for wires, cables, and the like are not included in this definition.

(2) "Derrick floor" means an elevated floor of a building or structure that has been designated to receive hoisted pieces of steel before final placement.

(3) "Double connection" means an attachment method where the connection point is intended for 2 pieces of steel that share common bolts on either side of a central piece.

(4) "Double connection seat" means a structural attachment that, during the installation of a double connection, supports the first member while the second member is connected.

(5) "Erection bridging" means the bolted diagonal bridging that is required to be installed before releasing the hoisting cables from the steel joists.

(6) "Fall restraint system" means a fall protection system that prevents the user from falling any distance. The system is comprised of either a body belt or body harness, together with an anchorage, connectors, and other necessary equipment. The other components typically include a lanyard, and may also include a lifeline and other devices.

(7) "Final interior perimeter" means the perimeter of a large permanent open space within a building such as an atrium or courtyard. This does not include openings for stairways, elevator shafts, and the like.

(8) "Girt, in systems-engineered metal buildings" means a "Z" or "C" shaped member formed from sheet steel spanning between primary framing and supporting wall material.

(9) "Headache ball" means a solid iron weight, usually spherical, used to keep the loadline taut and positioned above the hook.

(10) "Hoisting equipment" means commercially manufactured lifting equipment designed to lift and position a load of known weight to a location at some known elevation and horizontal distance from the equipment's center of rotation.

"Hoisting equipment" includes, but is not limited to, all of the following:

- (a) Cranes.
- (b) Derricks.
- (c) Tower cranes.
- (d) Barge-mounted derricks or cranes.
- (e) Gin poles.
- (f) Gantry hoist systems.

A "come-a-long," that is, a mechanical device, usually consisting of a chain or cable attached at each end, that is used to facilitate movement of materials through leverage is not considered "hoisting equipment."

(11) "Leading edge" means the unprotected side and edge of a floor, roof, or formwork for a floor or other walking/working surface, such as a deck, which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed.

(12) "Metal decking" means a commercially manufactured, structural grade, **cold-rolled** ~~cold-rolled~~ metal panel formed into a series of parallel ribs. As used in this part, the term includes metal floor and roof decks, standing seam metal roofs, other metal roof systems, and other products, such as bar gratings, checker plate, expanded metal panels, and similar products. After installation and proper fastening, these decking materials serve a combination of functions, including, but

not limited to, any of the following:

- (a) A structural element designed in combination with the structure to resist, distribute, and transfer loads, stiffen the structure, and provide a diaphragm action.
- (b) A walking/working surface.
- (c) A form for concrete slabs.
- (d) A support for roofing systems.
- (e) A finished floor or roof.

(13) "Multiple lift rigging" means a rigging assembly manufactured by wire rope rigging suppliers that facilitates the attachment of up to 5 independent loads to the hoist rigging of a crane.

R 408.42608 Site layout, erection plan, and construction sequence.

Rule 2608. (1) Before authorizing the commencement of steel erection, the controlling contractor shall ensure that the steel erector is provided with the following written notifications:

- (a) The concrete in the footings, piers, and walls and the mortar in the masonry piers and walls has attained, on the basis of an appropriate ASTM standard test method of field-cured samples, either 75% of the intended minimum compressive design strength or sufficient strength to support the loads imposed during steel erection.
- (b) Any repairs, replacements, and modifications to the anchor bolts were conducted in accordance with R 408.42626(5) and (6).

(2) A steel erection contractor shall not erect steel unless it has received written notification that the concrete in the footings, piers, and walls or the mortar in the masonry piers and walls has attained, on the basis of an appropriate ASTM standard test method of field-cured samples, either 75% of the intended minimum compressive design strength or sufficient strength to support the loads imposed during steel erection.

(3) The controlling contractor shall ensure that both of the following are provided and maintained:

(a) Adequate access roads into and through the site for the safe delivery and movement of derricks, cranes, trucks, other necessary equipment, and the material to be erected and means and methods for pedestrian and vehicular control. However, this requirement does not apply to roads outside of the construction site.

(b) A firm, properly graded, drained area which is readily accessible to the work and which has adequate space for the safe storage of materials and the safe operation of the erector's equipment.

(4) All hoisting operations in steel erection shall be preplanned to ensure that the requirements of **R 408.42609(5) and (6)** ~~R 408.42609(4) and (5)~~ are met.

(5) If an employer elects, due to conditions specific to the site, to develop alternate means and methods that provide employee protection in accordance with **R 408.42609(4)**, ~~R 408.42609(3)~~, R 408.42634(4), or R 408.42638(4), then a site-specific erection plan shall be developed by a qualified person and be available at the work site. Guidelines for establishing a site-specific erection plan are contained in appendix A.

R 408.42609. Hoisting and rigging.

Rule 2609. (1) All the provisions of **Construction Safety Standard construction safety standard Part 10- "Lifting and Digging Equipment," as referenced in R 408.42602.** ~~being R 408.41001a to R 408.41099a,~~ apply to hoisting and rigging.

(2) The headache ball, hook or load shall not be used to transport personnel except as provided in subrule (3) of this rule. ~~Personnel hoisting in steel erection is covered by construction safety standard Part 28. "Personnel Hoisting in Steel Erection," being R 408.42801 to R 408.42809.~~

(3) Cranes or derricks may be used to hoist employees when work under this rule is being conducted, provided either of the following provisions is met:

(a) All of the requirements of the Construction Safety Standard Part 10 "Lifting and Digging Equipment," R 408.41021a, except for R 408.41021a(1), as referenced in R 408.42602.

(b) All of the requirements of the Construction Safety Standard Part 28 "Personnel Hoisting in Steel Erection," as referenced in R 408.42602.

~~(4)(3)~~ Safety latches on hooks shall not be deactivated or made inoperable, except in either of the following situations:

(a) When a qualified rigger has determined that the hoisting and placing of purlins and single joists can be performed more safely by doing so.

(b) When equivalent protection is provided in a site-specific erection plan.

(5)(4) Routes for suspended loads shall be preplanned to ensure that no employee is required to work directly below a suspended load, except for the following employees:

(a) Employees engaged in the initial connection of the steel.

(b) Employees necessary for the hooking or unhooking of the load.

(6)(5) When working under suspended loads, all of the following criteria shall be met:

(a) Materials being hoisted shall be rigged to prevent unintentional displacement.

(b) Hooks with self-closing safety latches or their equivalent shall be used to prevent components from slipping out of the hook.

(c) All loads shall be rigged by a qualified rigger.

R 408.42626 Column anchorage, erection stability, repair, replacement, and anchor rods (anchor bolts).

Rule 2626. (1) All columns shall be anchored by a minimum of 4 anchor rods (anchor bolts).

(2) Each column anchor rod, ~~(or anchor bolt)~~ assembly, including the **column-to-base** ~~column-to-base~~ plate weld and the column foundation, shall be designed to resist a minimum eccentric gravity load of 300 pounds (136.2 kg) located 18 inches (.46 m) from the extreme outer face of the column in each direction at the top of the column shaft.

(3) Columns shall be set on level finished floors, pre-grouted leveling plates, leveling nuts, or shim packs that are adequate to transfer the construction loads.

(4) All columns shall be evaluated by a competent person to determine whether guying or bracing is needed. The employer shall have it installed. If guying or bracing is needed, then it shall be installed.

(5) Anchor rods (anchor bolts) shall not be repaired, replaced, or field-modified without the approval of the project structural engineer of record.

(6) Before the erection of a column, the controlling contractor shall provide written notification to the steel erector if there has been any repair, replacement, or modification of the anchor rods, ~~(or anchor bolts),~~ of that column.

R 408.42629 Double connections.

Rule 2629. (1) If 2 structural members on opposite sides of a column web, or a beam web over a column, are connected sharing common connection holes, then at least 1 bolt with its wrench-tight nut shall remain connected to the first member unless a **shop-attached** ~~shop-attached~~ or field-attached seat or equivalent connection device is supplied with the member to secure the first member and prevent the column from being displaced (see appendix H for examples of equivalent connection devices).

(2) If a seat or equivalent device is used, then the seat, ~~(or device),~~ shall be designed to support the load during the double connection process. The seat or equivalent device shall be adequately bolted or welded to both a supporting member and the first member before the nuts on the shared bolts are removed to make the double connection.

R 408.42643 Systems-engineered metal buildings.

Rule 2643. (1) All of the requirements of this part apply to the erection of **systems engineered** ~~systems-engineered~~ metal buildings, except for R 408.42626, R 408.42634, R 408.42636, and R 408.42638.

(2) Each structural column shall be anchored by a minimum of 4 anchor rods, ~~(or anchor bolts)~~.

(3) Rigid frames shall have 50% of their bolts or the number of bolts specified by the manufacturer, whichever is greater, installed and tightened on both sides of the web adjacent to each flange before the hoisting equipment is released.

(4) Construction loads shall not be placed on any structural steel framework unless the framework is safely bolted, welded, or otherwise adequately secured.

(5) In girt and eave strut-to-frame connections, when girts or eave struts share common connection holes, at least 1 bolt with its wrench-tight nut shall remain connected to the first member unless a manufacturer-supplied, field-attached seat or similar connection device is present to secure the first member so that the girt or eave strut is always secured against displacement.

(6) Both ends of all steel joists or cold-formed joists shall be fully bolted or welded to the support structure before any of the following:

(a) Releasing the hoisting cables.

(b) Allowing an employee on the joists.

(c) Allowing any construction loads on the joists.

(7) Purlins and girts shall not be used as an anchorage point for a fall arrest system unless written approval is obtained from a qualified person.

(8) Purlins may only be used as a walking/working surface when installing safety systems, after all permanent bridging has been installed and fall protection is provided.

(9) Construction loads may be placed only within a zone that is within 8 feet (2.5 m) of the centerline of the primary support member.

R 408.42651 Criteria for fall protection equipment; custody of fall protection.

Rule 2651. (1) Guardrail systems, safety net systems, personal fall arrest systems, positioning device systems and their components shall conform to the criteria in **Construction Safety Standard Part 45 "Fall Protection," as referenced in R 408.42602.** ~~29 C.F.R. §1926.502, which is adopted by reference in R 408.44502 of construction safety standard Part 45. "Fall Protection," being R 408.44501 to R 408.44502.~~ (See appendix G)

(2) Fall arrest system components shall be used in fall restraint systems and shall conform to the criteria in **Construction Safety Standard Part 45 "Fall Protection," as referenced in R 408.42602.** ~~29 C.F.R. §1926.502, which is adopted by reference in R 408.44502 of construction safety standard Part 45. "Fall Protection," being R 408.44501 to R 408.44502.~~ (See appendix G) Either body belts or body harnesses shall be used in fall restraint systems.

(3) Perimeter safety cables shall meet the criteria for guardrail systems in **Construction Safety Standard Part 45 "Fall Protection," as referenced in R 408.42602.** ~~29 C.F.R. §1926.502, which is adopted by reference in R 408.44502 of construction safety standard Part 45. "Fall Protection," being R 408.44501 to R 408.44502.~~ (See appendix G)

(4) Fall protection provided by the steel erector shall remain in the area where steel erection activity has been completed, to be used by other trades, only if the controlling contractor or its authorized representative has done both of the following:

- (a) Directed the steel erector to leave the fall protection in place.
- (b) Inspected and accepted control and responsibility of the fall protection before authorizing persons other than steel erectors to work in the area.

R 408.42655 Special training.

Rule 2655. (1) An employer shall ensure that each employee who performs multiple lift rigging has been provided training in both of the following areas:

- (a) The nature of the hazards associated with multiple lifts.
 - (b) The proper procedures and equipment to perform multiple lifts required by R 408.42610.
- (2) An employer shall ensure that each connector has been provided training in **all both** of the following areas:

- (a) The nature of the hazards associated with connecting.
- (b) The establishment, access, proper connecting techniques, and work practices required by R 408.42629(1) and (2) and R 408.42646.
- (c) Specific training on personnel hoisting as prescribed in Construction Safety Standard Part 28- "Personnel Hoisting in Steel Erection," **as referenced in R 408.42602.** ~~being R 408.42801 to R 408.42809.~~

(3) Where CDZs are being used, an employer shall assure that each employee has been provided training in both of the following areas:

- (a) The nature of the hazards associated with work within a controlled decking zone.
- (b) The establishment, access, proper installation techniques, and work practices required by R 408.42620, R 408.42622, R 408.42640, and R 408.42648.