

CS Part 25 Concrete Construction Strike Bold Draft – FINAL EFFECTIVE AUGUST 17, 2016

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

DIRECTOR'S OFFICE

CONSTRUCTION SAFETY STANDARDS

Filed with the Secretary of State on August 10, 2016

These rules become effective immediately upon filing with the Secretary of State unless adopted under **section sections** 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 408.42501, R 408.42502, R 408.42503, R 408.42517, R 408.42518, R 408.42520, R 408.42523, and R 408.42533 of the Michigan Administrative Code are amended, as follows:

PART 25. CONCRETE CONSTRUCTION

R 408.42501 Scope.

Rule 2501. This **standard part** pertains to all of the following:

- (a) The reinforcing, pouring, stressing, lifting, and floating of concrete.
- (b) The construction of forms and shoring used in connection with concrete construction.
- (c) Prestressed and poststressed operations.
- (d) Precast, tilt-up, and lift-slab operations.

R 408.42502 Adoption of standards.

Rule 2502.(1) The following standards are adopted by reference in these rules and are available from Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado, 80112, telephone number 1-800-854-7179, website: www.global.ihs.com, at a cost as of the time of adoption of these rules, as stated in this rule:

(a) American National Standard Institute standard ANSI A10.9, "Concrete Construction and Masonry Work," 1983 edition. Cost: \$20.00.

(b) American Welding Society standard AWS D1.1/D1.1M, "Structural Welding Code Steel," 2002 edition. Cost: \$468.00.

(2) The following standard is adopted by reference in these rules, American Welding Society standard AWS B1.10, "Guide for the Nondestructive Examination of Welds," 1999 edition. This standard is available from The AWS Store Customer Service, 13301 NW 47 Avenue, Opa-Locka, Florida 33054 USA; telephone number: 305-826-6192; or via the internet at website: www.aws.org; at a cost as of the time of adoption of these rules of \$104.00.

(3) The standards adopted in **these rules subrules(1) and(2) of this rule are also** available for inspection at the Michigan Department of Licensing And Regulatory Affairs, MIOSHA **Regulatory Services Standards** Section, ~~7150 Harris Drive~~ **530 West Allegan Street, P.O. Box 30643**, Lansing, Michigan 48909-8143.

(4) Copies of these **standards standards, adopted in this rule,** may be obtained from the publisher or may ~~also~~ be obtained from the Department of Licensing and Regulatory Affairs, MIOSHA **Regulatory Services Standards** Section, ~~7150 Harris Drive~~ **530 West Allegan Street**, P.O. Box 30643, Lansing, Michigan, 48909-8143, at the cost charged in this rule, plus \$20.00 for shipping and handling.

R 408.42503 Reference of standards.

Rule 2503. The following Michigan occupational safety and health standards (**MIOSHA**) are referenced in these rules. Up to 5 copies of these standards may be obtained at no charge from the Michigan Department of Licensing And Regulatory Affairs, MIOSHA **Regulatory Services Section, Standards Division, 7150 Harris Drive 530 West Allegan Street**, P.O. Box 30643, Lansing, Michigan, 48908-8143, or via the internet at website: www.michigan.gov/mioshastandards. For quantities greater than 5, the cost, at the time of adoption of these rules, is 4 cents per page.

(a) Construction Safety Standard Part 12 "Scaffolds and Scaffold Platforms," R 408.41201 to R 408.41264.

(b) Construction Safety Standard Part 21 "Guarding of Walking and Working Areas," R 408.42101 to R 408.42160.

(c) Construction Safety Standard Part 45 "Fall Protection," R 408.44501 to R 408.44502.

R 408.42517 Construction equipment and material requirements; adoption by reference.

Rule 2517. (1) Equipment and material used in concrete construction and masonry work shall meet the applicable requirements prescribed in American national standard institute standard **ANSI A10.9, "Concrete Construction and Masonry Work,"** concrete construction and masonry work, 1983 edition, **as which is adopted in R 408.42502.** by reference.

(2) The minimum safety factors of formwork accessories shall be as prescribed in table 1, as follows:

TABLE 1		
MINIMUM SAFETY FACTORS OF FORMWORK ACCESSORIES*		
Accessory	Safety Factor	Type of Construction
Form Tie	1.5	Light formwork, 8 feet or less in height with no hazard to life.
	2.0	All formwork over 8 feet in height or hazardous to life. Formwork for architectural concrete.
Form Anchor	2.0	Formwork supporting form weight and concrete pressures only.
	3.0	Formwork supporting weight of forms, concrete, construction live loads, and impact.
Form Hangers	2.0	All applications.
Anchoring inserts used as form ties.	2.0	Precast concrete panels when used as formwork.
*Safety factors are based on ultimate strength of accessory.		

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R 408.42518 Reinforcing steel.

Rule 2518. (1) A route designated as a means of access or egress across reinforcing steel for general traffic shall be provided with a walkway.

(2) **All protruding reinforcing steel, onto and into which employees could fall, shall be guarded to eliminate the hazard of impalement.** ~~An employee shall not be permitted to work above vertically protruding reinforcing steel unless the steel has been protected to eliminate the hazard of impalement of the employee.~~

(3) Reinforcing steel or walls, piers, columns, and other similar vertical structures shall be guyed, braced, or otherwise supported to prevent collapse.

(4) Reinforcing steel shall not be used as a scaffolding hook or stirrup or as a load-bearing member in a lifting device.

(5) Reinforcing steel shall not be welded and used as a load-bearing member.

(6) Roll wire mesh shall be secured at each end to prevent dangerous recoiling action.

R 408.42520 Concrete mixing, pouring, and floating.

Rule 2520. (1) A concrete mixer that is equipped with a 1-yard or larger loading skip shall be equipped with a mechanical device to clear the skip of material.

(2) A guardrail that is capable of withstanding a 200-pound side thrust shall be provided on each side of a skip on a mixer that has a capacity of 1 or more yards.

(3) The handle on a bull float that is used where it may contact an energized electrical conductor shall be constructed of nonconductive material or shall be insulated with a nonconductive sheath that has electrical and mechanical characteristics which provide the equivalent protection of a handle constructed of nonconductive material.

(4) A powered and rotating-type concrete troweling machine that is manually guided shall be equipped with a control switch that will automatically shut off the power when the **operator removes his or her hands** ~~of the operator are removed~~ from the equipment handles or switch.

(5) The handles of a concrete buggy shall not extend horizontally beyond the wheels on either side of the buggy.

(6) A concrete bucket that is equipped with a hydraulically or pneumatically operated gate shall have a positive safety latch or a similar safety device installed to prevent premature or accidental dumping. The bucket shall be designed to prevent aggregate and loose material from accumulating on the top and sides of the bucket.

(7) An employee shall not be permitted to ride a bucket or walk or work under a bucket that is suspended from a crane or cableway.

(8) A concrete bucket that is positioned by a crane or cableway shall be suspended from an approved swivel safety-type hook.

(9) A pumpcrete or similar system using discharge pipe shall have pipe supports that are designed for a 100% overload. Compression air hoses in the system shall be provided with positive fail-safe joint connectors to prevent the separation of sections when pressurized.

(10) A runway, ramp, or ~~scaffold scaffold~~, shall be provided for placement of concrete in areas such as walls, piers, columns, and beams, as prescribed in Construction Safety Standards **Part 12** ~~Part 12~~. "Scaffolds and Scaffold Platforms," Part 21 "**Guarding** ~~Guarding~~ of Walking and Working **Areas**," ~~Areas~~," and Part 45 "Fall Protection," as referenced in R 408.42503.

(11) A concrete mixer, or other equipment, such as a compressor, screen, or pumps used for concrete construction activities, where inadvertent operation of the equipment may occur and cause **injury**, ~~injury~~ shall be locked out when an employee is performing maintenance or repair. An employee who is inside a concrete mixer performing maintenance or repair shall have the only key to the lock.

(12) Sections of tremies and similar concrete conveyances shall be secured with wire rope, or equivalent materials, in addition to the regular couplings or connections.

R 408.42523 Vertical slip forms.

Rule 2523. (1) Field operations for vertical slip forms shall be under the supervision of a qualified person. The qualified person shall be present on the deck during slipping operations.

(2) A lift shall proceed steadily and uniformly and shall not exceed the predetermined rate of lift.

(3) The steel rods or pipe on which the jacks climb or by which the forms are lifted shall be specifically designed for such climbing or lifting. Such rods shall be adequately braced if they are not encased in concrete.

(4) Jacks and vertical supports shall be positioned so that the vertical loads are distributed equally and do not exceed the capacity of the jacks.

(5) The jacks or other lifting devices shall be provided with mechanical dogs or other automatic holding devices to prevent slippage due to the failure of the power supply of the lifting mechanism.

(6) Vertical lift forms shall be provided with scaffolding or work platforms that completely encircle the area of placement. The scaffolds shall be as prescribed in **Construction Safety Standard Part 12 "Scaffolds and Scaffold Platforms," as referenced in R 408.42503.** ~~Scaffolds and Scaffold Platforms, Part 12., R 408.41201 et seq.~~

(7) Lateral and diagonal bracing of vertical slip forms shall be provided to prevent excessive distortion of the structure during the jacking operation.

(8) During a jacking operation, **a qualified person shall maintain** the form structure ~~shall be maintained~~ in line and plumb.

R 408.42533 Lift-slab operations.

Rule 2533. (1) A registered professional engineer who is qualified in lift-slab operations shall design and plan lift-slab operations. An employer shall implement the plans and designs and shall include detailed instructions and sketches that indicate the prescribed method of erection. The plans and designs shall also include provisions for ensuring lateral stability of the building or structure during construction.

(2) An employer shall ensure that jacks are marked to indicate the rated capacity established by the manufacturer.

(3) An employer shall ensure that jacks are not loaded beyond the rated capacity established by the manufacturer.

(4) An employer shall ensure that jacking equipment is not overloaded and the threaded rods and other members that transmit loads to the jacks are capable of supporting not less than 2 1/2 times the load to be applied. Jacking equipment shall include all of the following:

(a) Jacks and other lifting units.

(b) Lifting angles.

(c) Lifting nuts.

(d) Hook-up collars.

(e) T-caps.

(f) Shearheads.

(g) Columns and footings.

(5) An employer shall ensure that a jack is designed and installed so that it will not lift or continue to lift when it is loaded in excess of its rated capacity.

(6) An employer shall ensure that a jack has a safety device installed that will cause the jack to support the load in any position if the jack malfunctions or loses its lifting ability.

(7) An employer shall ensure that jacking operations are synchronized to ensure even and uniform lifting of the slab. An employer shall ensure, that during lifting, all points of the slab support are kept within 1/2 of an inch of that needed to maintain the slab in a level position.

(8) If leveling is automatically controlled, then an employer shall ensure that a device is installed which will stop the operation when the 1/2-inch tolerance specified in subrule (7) of this rule is exceeded or when there is a malfunction in the jacking system.

(9) An employer shall ensure that the maximum number of manually controlled jacks on 1 slab is limited to a number, which shall not be more than 14, that will permit the operator to maintain the slab level within specified tolerances. The controls shall be located near a qualified person.

(10) An employer shall ensure that an employee, except for an employee who is essential to the jacking operation, is not permitted in the building while any jacking operation is taking place. For the purpose of this subrule, a jacking operation begins when a slab or group of slabs is lifted and ends when the slabs are secured with either temporary connections or permanent connections.

(11) An employer shall ensure that an employee is not permitted under a slab during jacking operations.

(12) An employer shall ensure that all welding on temporary and permanent connections is performed in accordance with the requirements of the American welding society standards AWS D1.1/D1.1M, ~~2002 edition, Structural~~ **“Structural Welding Code Steel, Steel,” 2002 edition**, and AWS B1.10, ~~1999 edition, Guide~~ **“Guide for the Nondestructive Examination of Welds. Welds,” 1999 edition**. These standards are adopted by reference in R 408.42503. An employer shall ensure that the welders are familiar with the welding requirements specified in the lift-slab plan and specifications.

(13) An employer shall ensure that load transfer from jacks to building columns is not executed until the welds on the column shear plates are cooled to air temperature.

(14) An employer shall ensure that jack-lifting units are positively secured to building columns so that they do not become dislodged or dislocated.

(15) An employer shall ensure that equipment is designed and installed so that the lifting rods cannot slip out of position or the employer shall initiate other measures, such as the use of locking or blocking devices, that will provide attachments and prevent components from disengaging during lifting operations.

(16) Lifting devices, other than jacks covered by **subrule (4)** ~~subrule(4)~~ of this rule, shall be of sufficient strength and design to provide a safety factor not less than 5 times the working load.