

(Effective until October 1, 2020)

WAC 296-155-680 General provisions. (1) **General.** All equipment, material and construction techniques used in concrete construction and masonry work must meet the applicable requirements for design, construction, inspection, testing, maintenance and operations as prescribed in ANSI A10.9-1997, Concrete and Masonry Work Safety Requirements.

(2) **Construction loads.** You must not place any construction loads on a concrete structure or portion of a concrete structure unless the employer determines, based on information received from a person who is qualified in structural design, that the structure or portion of the structure is capable of supporting the loads.

(3) **Vertical loads.** Vertical loads consist of a dead load plus an allowance for live load. The weight of formwork together with the weight of freshly placed concrete is dead load. The live load consists of the weight of workers, equipment, runways and impact, and must be computed in pounds per square foot (psf) of horizontal projection.

(4) **Lateral loads.** Braces and shores must be designed to resist all foreseeable lateral loads such as wind, cable tensions, inclined supports, impact of placement, and starting and stopping of equipment. The assumed value of load due to wind, impact of concrete, and equipment acting in any direction at each floor line must not be less than 100 pounds per lineal foot of floor edge or two percent of total dead load of the floor, whichever is greater. Wall forms must be designed for a minimum wind load of 10 psf, and bracing for wall forms should be designed for a lateral load of at least 100 pounds per lineal foot of wall, applied at the top. Walls of unusual height require special consideration.

(5) **Special loads.** Formwork must be designed for all special conditions of construction likely to occur, such as unsymmetrical placement of concrete, impact of machine-delivered concrete, uplift, and concentrated loads.

(6) You must check form supports and wedges during concrete placement to prevent distortion or failure.

(7) **Reinforcing steel.**

(a) You must guard all protruding reinforcing steel, onto and into which employees could fall, to eliminate the hazard of impalement.

(b) Wire mesh rolls: You must secure wire mesh rolls at each end to prevent dangerous recoiling action.

(c) Guying: You must guy or support reinforcing steel for walls, piers, columns, and similar vertical structures to prevent overturning and to prevent collapse.

(8) **Post-tensioning operations.**

(a) You must not permit any employee (except those essential to the post-tensioning operations) to be behind the jack during tensioning operations.

(b) You must erect signs and barriers to limit employee access to the post-tensioning area during tensioning operations.

(c) You must handle stressed members at pick points specifically designated on the manufacturer's drawings.

(d) You must lift stressed members with lifting devices recommended by the manufacturer or the engineer in charge.

(e) You must not allow anyone under stressed members during lifting and erecting.

(9) **Working under loads.**

(a) You must not permit any employee to work under concrete buckets while buckets are being elevated or lowered into position.

(b) To the extent practical, you must route elevated concrete buckets so that no employee, or the fewest number of employees, are exposed to the hazards associated with falling concrete buckets.

(10) **Personal protective equipment.**

(a) You must not permit any employee to apply a cement, sand, and water mixture through a pneumatic hose unless the employee is wearing protective head and face equipment.

(b) You must not permit any employee to place or tie reinforcing steel more than 6 feet (1.8 m) above any adjacent working surface unless the employee is protected by personal fall arrest systems, safety net systems, or positioning device systems meeting the criteria of chapter 296-155 WAC, Part C-1.

(c) You must protect each employee on the face of formwork or reinforcing steel from falling 6 feet (1.8 m) or more to lower levels by personal fall arrest systems, safety net systems, or positioning device systems meeting the criteria of chapter 296-155 WAC, Part C-1.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. WSR 16-09-085, § 296-155-680, filed 4/19/16, effective 5/20/16. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.440, 49.17.060, and 29 C.F.R. 1926, Subpart CC. WSR 12-01-086, § 296-155-680, filed 12/20/11, effective 2/1/12. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060 and chapter 49.17 RCW. WSR 10-11-103, § 296-155-680, filed 5/18/10, effective 7/1/10. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. WSR 00-14-058, § 296-155-680, filed 7/3/00, effective 10/1/00. Statutory Authority: Chapter 49.17 RCW. WSR 94-15-096 (Order 94-07), § 296-155-680, filed 7/20/94, effective 9/20/94; WSR 90-17-051 (Order 90-10), § 296-155-680, filed 8/13/90, effective 9/24/90; WSR 90-03-029 (Order 89-20), § 296-155-680, filed 1/11/90, effective 2/26/90; WSR 89-11-035 (Order 89-03), § 296-155-680, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. WSR 86-03-074 (Order 86-14), § 296-155-680, filed 1/21/86; Order 74-26, § 296-155-680, filed 5/7/74, effective 6/6/74.]

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(4) **Lateral loads.** Braces and shores must be designed to resist all foreseeable lateral loads such as wind, cable tensions, inclined supports, impact of placement, and starting and stopping of equipment. The assumed value of load due to wind, impact of concrete, and equip-

ment acting in any direction at each floor line must not be less than 100 pounds per lineal foot of floor edge or two percent of total dead load of the floor, whichever is greater. Wall forms must be designed for a minimum wind load of 10 psf, and bracing for wall forms should be designed for a lateral load of at least 100 pounds per lineal foot of wall, applied at the top. Walls of unusual height require special consideration.

(5) **Special loads.** Formwork must be designed for all special conditions of construction likely to occur, such as unsymmetrical placement of concrete, impact of machine-delivered concrete, uplift, and concentrated loads.

(6) You must check form supports and wedges during concrete placement to prevent distortion or failure.

(7) **Site access and layout.** The controlling contractor must ensure that the following is 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, the material to be erected, and the means and methods for pedestrian and vehicular control.

Exception: This requirement does not apply to roads outside of the construction site.

(b) A firm, properly graded, and drained area, that is readily accessible to the work with adequate space for the safe assembly, rigging and storage of reinforcing and post-tensioning materials, and the safe operation of the reinforcing contractor's equipment.

(c) Adequate exterior platform for landing materials on the floors of multi-tiered buildings.

Exception: Where the design, structure, or space constraint precludes the installation of exterior platforms.

Exception: Where the design of the structure allows for the safe landing of materials without the exterior platform.

(d) Adequate protective system designed and constructed in accordance with Chapter 155 Part N Excavation, Trenching, and Shoring prior to the commencement of reinforcing operations in excavations and/or trenches.

(8) **Written notifications prior to commencement of and immediately following reinforcing steel installation and concrete placement.**

The controlling contractor must ensure that the reinforcing steel contractor on the project is provided with the following written notifications at the times indicated:

(a) Prior to commencement of reinforcing steel installation, that formwork and falsework has been inspected by a competent person and determined to meet the design requirements of the installing formwork/falsework contractor as indicated in (b) and (c) of this subsection and immediately after the installation of reinforcing steel and placement of the concrete.

(b) Prior to commencement of reinforcing steel installation, that the vertical formwork, elevated decks, and other working/walking surfaces are structurally stable and remain adequately braced, guyed, or supported to allow safe access of reinforcing workers, materials, and equipment.

(c) Prior to commencement of reinforcing steel installation, that the protective system for excavations and/or trenches has been inspected by a competent person.

(9) **Sustainability requirements for vertical and horizontal columns, walls, and other reinforcing assemblies.**

(a) Reinforcing steel for walls, piers, columns, prefabricated reinforcing steel assemblies, and similar vertical structures must be guyed, braced, or supported to prevent collapse.

(b) Guys, braces, or supports.

(i) Systems for guying, bracing, or supports must be designed by a qualified person.

(ii) Guys, braces, and supports must be installed and removed as directed by a competent person.

(c) Reinforcing steel must not be used as a guy or brace.

(d) The controlling contractor must prohibit other construction processes below or near the erection of reinforcement assemblies until they are adequately supported and/or secured to prevent structural collapse.

(e) The reinforcing steel contractor must flag specific areas of the erection level for their work activity. The guying and/or bracing must be in place before the release of the reinforcing assembly from the hoist rigging.

(10) **Impalement protection and custody.**

(a) You must guard all protruding reinforcing steel, onto and into which employees could fall, to eliminate the hazard of impalement.

(b) Wire mesh rolls: You must secure wire mesh rolls at each end to prevent dangerous recoiling action.

(c) When protective covers are provided by the reinforcing steel contractor, the protective covers must remain in place after reinforcing steel activities have been completed to protect workers from other trades only if the controlling contractor or its authorized representative:

(i) Had directed the reinforcing steel contractor to leave the protective covers in place; and

(ii) Has inspected and accepted control and responsibility for the protective covers; or

(iii) Has placed control and responsibility for the protective covers on another contractor other than the reinforcing steel contractor.

Note: The responsibilities of the controlling contractor related to accepting the control and custody of protective covers does not relieve the individual employer or subcontractor from protecting their employees from impalement hazards in accordance with the provisions of this subsection.

(11) **Post-tensioning operations.** The controlling contractor must:

(a) Provide written documentation to the employer performing the stressing operation that the minimum specified initial concrete compressive strength has been achieved prior to commencement of stressing operations.

(b) Ensure no employees (except those essential to the post-tensioning operations) are permitted to be behind the jack or the fixed end anchorage during tensioning operations. No employees are permitted above or alongside the full length of the tendons during tensioning operations.

(c) Ensure signs and barricades are erected to limit access into the stressing area only to personnel engaged in stressing or de-tensioning operations.

(d) Prohibit other construction trades from working in the barricaded area during stressing operations.

(e) Ensure there is an adequate safe work platform of a minimum of three feet measured from the end of the floor slab to the platform toeboard, such as an extension of the formwork, for stressing tendons, cutting tendon tails, and grouting where tensioning operations are above grade.

Exception: Where the adjoining structure or other structural space constraint precludes the installation of exterior platforms.

(i) The work platform required in (e) of this subsection must include guardrails and toeboards meeting the requirements of WAC 296-880-40005; and

(ii) The work platform required in (e) of this subsection must be kept clear of any debris or materials not related to the stressing or de-tensioning operation.

(f) Ensure stressing equipment is secured to prevent accidental displacement during operation.

(g) Ensure stressing equipment calibrations specifications are available on site. Prior to stressing, a competent person must verify the adequacy of the stressing equipment calibrations.

(h) Ensure a competent person inspects the stressing equipment for damage or defects before stressing operations begin, and periodically during the stressing operations. The use of stressing equipment must conform to the manufacturer's instructions and recommendations.

(i) Ensure methods are employed to ensure that supporting forms, falsework or shoring does not fall due to cambering of the concrete during the stressing operations. Dead loads and construction loads (including those due to stressing) must be considered in the design of the forms, falsework, and shoring.

(12) Hoisting of stressed members.

(a) You must handle stressed members at pick points specifically designated by the manufacturer.

(b) You must lift stressed members with lifting devices recommended by the manufacturer or the engineer in charge.

(c) No one shall be allowed under stressed members during lifting and erecting.

(13) Working under loads.

(a) You must not permit any employee to work under concrete buckets while buckets are being elevated or lowered into position.

(b) To the extent practical, you must route elevated concrete buckets so that no employee, or the fewest number of employees, are exposed to the hazards associated with falling concrete buckets.

(c) Reinforcing assemblies:

(i) Routes for suspended loads must be preplanned to ensure that no employee is required to work directly below a suspended load except for:

(A) Employees engaged in the placing or initial connection of the reinforcement assemblies; and

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

(ii) When working under suspended loads, the following criteria must be met:

(A) Materials being hoisted must be rigged to prevent unintentional displacement;

(B) Hooks with self-closing safety latches or their equivalent must be used to prevent components from slipping out of the hook; and

(C) The controlling contractor must prohibit all activities under or in the hazard area of hoisting operations, including unloading and staging areas for reinforcing assemblies.

(14) Personal protective equipment.

(a) You must not permit any employee to apply a cement, sand, and water mixture through a pneumatic hose unless the employee is wearing protective head and face equipment.

(b) Fall protection must be provided at four feet or more in accordance with WAC 296-880-20005(6).

(15) Training requirements.

Employers must ensure that each employee who performs reinforcing steel and/or post-tensioning activities has been provided training by a qualified person in the following areas for the activities in which they are engaged:

(a) The hazards associated with reinforcing steel and post-tensioning activities; and

(b) The proper procedures and equipment to perform reinforcing steel and post-tensioning activities.

(16) **Retraining.**

When the employer has reason to believe that any employee who has already been trained does not have the understanding or skill required by subsection (15) of this section, you must retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:

(a) Changes in the workplace render previous training obsolete; or

(b) Changes in the types of systems or equipment to be used render previous training obsolete; or

(c) Inadequacies in an employee's knowledge of procedures or use of equipment indicate that the employee has not retained the requisite understanding or skill.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060 and chapter 49.17 RCW. WSR 20-08-117, § 296-155-680, filed 3/31/20, effective 10/1/20. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. WSR 16-09-085, § 296-155-680, filed 4/19/16, effective 5/20/16. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.440, 49.17.060, and 29 C.F.R. 1926, Subpart CC. WSR 12-01-086, § 296-155-680, filed 12/20/11, effective 2/1/12. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060 and chapter 49.17 RCW. WSR 10-11-103, § 296-155-680, filed 5/18/10, effective 7/1/10. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. WSR 00-14-058, § 296-155-680, filed 7/3/00, effective 10/1/00. Statutory Authority: Chapter 49.17 RCW. WSR 94-15-096 (Order 94-07), § 296-155-680, filed 7/20/94, effective 9/20/94; WSR 90-17-051 (Order 90-10), § 296-155-680, filed 8/13/90, effective 9/24/90; WSR 90-03-029 (Order 89-20), § 296-155-680, filed 1/11/90, effective 2/26/90; WSR 89-11-035 (Order 89-03), § 296-155-680, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. WSR 86-03-074 (Order 86-14), § 296-155-680, filed 1/21/86; Order 74-26, § 296-155-680, filed 5/7/74, effective 6/6/74.]