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I. Scaffolding Appendix

1. Outrigger Scaffold

   a. Outrigger beams shall extend not more than 6 feet beyond the face of the building. The inboard end of outrigger beams, measured from the fulcrum point to the extreme point of support, shall be not less than one and one-half times the outboard end in length. The beams shall rest on edge, the sides shall be plumb, and the edges shall be horizontal. The fulcrum point of the beam shall rest on a secure bearing at least 6 inches in each horizontal dimension. The beam shall be secured in place against movement and shall be securely braced at the fulcrum point against tipping.
   b. 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 joists 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.
   c. Unless outrigger scaffolds are designed by a licensed professional engineer, they shall be constructed and erected in accordance with table D-16. Outrigger scaffolds designed by a registered professional 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.
   d. Planking shall be laid tight and shall extend to within 3 inches of the building wall. Planking shall be nailed or bolted to outriggers.
   e. Where there is danger of material falling from the scaffold, a wire mesh or other enclosure shall be provided between the guardrail and the toe-board.
   f. 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 engineer.

2. -Point Suspen

l. The platform of every two-point suspension scaffold shall be one of the following types:
m. The side stringer of ladder-type platforms shall be clear straight-grained spruce or materials of equivalent strength and durability. The rungs shall be of straight-grained oak, ash, or hickory, at least 1 1/8 inch in diameter, with seven-eighth inch tenons mortised into the side stringers at least seven-eighth inch. The stringers shall be tied together with the tie rods not less than one-quarter inch in diameter, passing through the stringers and riveted up tight against washers on both ends. The flooring strips shall be spaced not more than five-eighth inch apart except at the side rails where the space may be 1 inch. Ladder-type platforms shall be constructed in accordance with table D-17.

Diameter (minimum)	1/4 in	1/4 in	1/4 in	1/4 in	1/4 in
Flooring, minimum finished size (in.)	½ x 2 3/4	½ x 2 3/4	½ x 2 3/4	½ x 2 3/4	½ x 2 3/4

equivalent, and toe-boards, shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toe-boards shall be a minimum of 4 inches in height.

i. When two or more scaffolds are used on a building or structure they shall not be bridged one to the other but shall be maintained at even height with platforms butting closely.

j. Each scaffold shall be installed or relocated in accordance with designs and instructions of a registered professional engineer, and such installation or relocation shall be supervised by a competent designated person.

5. Single-Point Adjustable Suspension Scaffolds

a. The scaffolding, including power units or manually operated winches, shall be a type tested and listed by a nationally recognized testing laboratory. Refer to 1910.399(a)(77) for definition of listed, and 1910.7 for nationally recognized testing laboratory.
b. All power-operated gears and brakes shall be enclosed.
c. In addition to the normal operating brake, all-power driven units must have an emergency brake which engages automatically when the normal speed of descent is exg0 GiGigE2reW*nBT/F1 12 Tf

e. The tackle shall consist of correct size ball bearing or bushed blocks and properly spliced 5/8-inch diameter first-grade manila rope.
f. The roof irons, hooks, or the object to which the tackle is anchored shall be securely installed. Tiebacks when used shall be installed at right angles to the face of the building and securely fastened to a chimney

7. _____

a. The brackets shall consist of a triangular wood frame not less than 2 by 3 inches in cross section, or of metal of equivalent strength. Each member shall be properly fitted and securely joined.
b. Each bracket shall be attached to the structure by means of one of the following:
    i. A bolt no less than five-eighths inch in diameter which shall extend through the inside of the building wall.
    ii. ii. A metal stud attachment device
    iii. Welding to steel tanks
    iv. Hooking over a well-secured and adequately strong supporting member.
    v. The brackets shall be spaced no more than 10 feet apart.
c. No more than two persons shall occupy any given 10 feet of a bracket scaffold at any one time. Tools and materials shall not exceed 75 pounds in addition to the occupancy.
d. The platform shall consist of not less than two 2- by 9-inch nominal size planks extending not more than 18 inches or less than 6 inches beyond each end support.
e. Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- by 4-inch lumber or equivalent, and toe-boards. shall be installed at all open sides on all scaffolds more than 10 feet above the ground or floor. Toe-boards shall be a minimum of 4 inches in height.

8. _____

a. The squares shall not exceed 5 feet in width and 5 feet in height.
b. Members shall be not less than those specified in Table D-18.
c. The squares shall be reinforced on both sides of each corner with 1- by 6-inch gusset pieces. They shall also have braces 1 by 8 inches on both sides running from center to center of each member, or other means to secure equivalent strength and rigidity.
d. The squares shall be set not more than 5 feet apart for medium duty scaffolds, and not more than 8 feet apart for light duty scaffolds. Bracing 1 x 8 inches, extending from the bottom of each square to the top of the next square, shall be provided on both front and rear sides of the scaffold.

Table D-18 Minimum Dimensions for

Members	Dimensions (Inches)
Bearers or horizontal members	2 by 6
Legs	2 by 6
Braces at corners	1 by 6
Braces diagonally from center frame	1 by 8

c. The ropes shall be attached to the needle beams by a scaffold hitch or a properly made

iv.

c. A substantial catch platform shall be installed below the working area of roofs more than 20 feet from the ground to eaves with a slope greater than 3 inches in 12 inches without a parapet. In width the platform shall extend 2 feet beyond the projection of the eaves and shall be provided with a safety rail, mid-rail, and toe-board. This provision shall not apply where employees engaged in work upon such roofs are protected by a safety belt attached to a lifeline.

16. Crawling Board or Chicken Ladders

a. Crawling boards shall be not less than 10 inches wide and 1inch-thick, having cleats 1 x 1 1/2 inches. The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed 24 inches. Nails shall be driven through and clinched on the underside. The crawling board shall extend from the ridge pole to the eaves when used in connection with roof construction, repair, or maintenance.
b. A firmly fastened lifeline of at least three-quarter-inch rope shall be strung beside each crawling board for a handhold.
c. Crawling boards shall be secured to the roof by means of adequate ridge hooks or equivalent effective means.

17. Float or Ship Scaffolds

a. Float or ship scaffolds shall support not more than three men and a few light tools, such as those needed for riveting, bolting, and welding. They shall be constructed in accordance with this section, unless substitute designs and materials provide equivalent strength, stability, and safety.
b. The platform shall be not less than 3 feet wide and 6 feet long, made of three-quarter-inch plywood, equivalent to American Plywood Association Grade B-B, Group I, Exterior.
c. Under the platform, there shall be two supporting bearers made from 2- x 4-inch, or 1- x 10-inch rough, selected lumber, or better. They shall be free of knots or other flaws and project 6 inches beyond the platform on both sides. The ends of the platform shall extend about 6 inches beyond the outer edges of the bearers. Each bearer shall be securely fastened to the platform.
d. An edging of wood not less than 3/4 x 1 1/2 inches, or equivalent, shall be placed around all sides of the platform to prevent tools from rolling off.
e. Supporting ropes shall be 1-inch diameter manila rope or equivalent, free from deterioration, chemical damage, flaws, or other imperfections. Rope connections shall be such that the platform cannot shift or slip. If two ropes are used with each float, each of the two supporting ropes shall be hitched around one end of a bearer and pass under the platforms to the other end of the bearer where it is hitched again, leaving sufficient rope at each end for the supporting ties.
f. Each workman shall be protected by a safety lifebelt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the workman in case of a fall.