



## **SCAFFOLDING SAFETY AND LADDER SAFETY**

### **SCAFFOLDING**

#### **OSHA 1926 SUBPART L**

Scaffolding is an integral and important facet of the construction industry. Specific standards need to be followed in accordance to manufactures specifications, OSHA specifications, and ANSI specifications most of the time all the standards match each other's but the Manufactures specifications supersede all other specific specifications.

The Superintendents for E Light are assigned to the project and shall be responsible for inspecting and supervising the erection and use of the scaffolding.

#### **GENERAL**

- The footing of scaffolds must be sound and rigid; capable of supporting four times the maximum intended load.
- Only when a competent person is present shall anyone erect, dismantle or move a scaffold.
- Scaffolds in excess of ten feet above the ground must have fall protection. A standard guardrail consists of a top rail at 42 inches high, mid-rail half way in between and a 4-inch toe board. All guardrails must be capable of withstanding 200 lbs. of force in any direction.
- All scaffold components shall be able to support at least four times the maximum intended load.
- Any scaffolding that has been damaged or weakened shall be immediately replaced or repaired,
- All planking or platforms shall be 2 inches by 12 inches by 8 feet.(Fully Planked)
- All planking shall be overlapped a minimum of 12 inches.
- An access ladder or other safe access shall be provided.
- Scaffold planks must extend over their end supports by 6 inches but not more than 12 inches.
- The legs or uprights shall be plumb and rigidly braced to prevent swaying. All cross bracing should be used.
- Shore or lean-to scaffolding shall not be used.
- Scaffold legs shall be set on adjustable bases, plan bases or other foundations adequate to support the maximum rated load.
- All pins to secure diagonal braces and to prevent uplifting shall be used.
- Periodic inspections shall be made of all scaffolds and accessories.
- Scaffolding must be fully planked.



### Designed Loads for Scaffolding

TYPE	LOAD PER SQUARE FT.	PERMISSIBLE SPAN
LIGHT	25	10 FT.
MEDIUM	50	8 FT.
HEAVY	75	6FT.

### SAFE CENTER LOADS FOR SCAFFOLDING PLANKS

Based on extreme stress of 1300 pounds per square inch. Douglas Fir, Silka Spruce, White Spruce, Red Pine and Portland Orford White Cedar.

The following will assist you in the determination of the safe center loads. Do not use any lumber under nominal thickness of 2 inches (actual 1-5/8 inches).

### SIZE OF PLANKS IN INCHES

SPAN IN FEET	2x8	2x10	2x12
6	230 lbs.	290 lbs.	355 lbs.
8	170	210	260
10	103	165	200
12	105	130	160
14	80	105	130
16	70	90	105

### SCISSOR LIFTS AND MANLIFTS (JLG) OPERATIONS

- Workers must be trained in the operation and use of the equipment.
- The equipment lifting capacity must be clearly identified.
- Handrails, midrails and toeboards must be in place and free from any damage.
- Harnesses and lanyards must also be worn in any lift. (Even if guardrails are present and if totally enclosed)
- Operating instructions must be legible.
- When welding from lift fire extinguisher must be in the lift basket.
- Travel is only permitted when the lift is in the down position.
- Lifting material, which extends beyond the guardrails, is not permitted.
- The maximum lift capacity shall not be exceeded.

Each employee must ensure that both the top rail and mid rail are in place when they are in the lift.



### **Scaffolding cheat sheet:**

- Mudsills if on dirt, need to be 180 square inches 2X10X18 Min.
- Base plates are next, cannot screw out more than 12 inch total.
- Up rights depending on distance between changes amount of weight. 6 ft. apart 75 pounds per square ft. 8 ft apart is 50 lbs. per square ft. 10 ft. apart is 25 lbs. per square ft. then take width and length times weight and times by 4 for four times maximum load.
- Must be fully braced, by cross braces, diagonal bracing or horizontal bracing. (No bracing left out)
- Planking – must be fully planked not gaps more than 1 inch between planks. Planks must overlap ends 6 to 12 inches, from plank to plank over lap 12 inch on each side of upright.
- Fall protection begins at 10 ft to your feet, and falling object protection also begins at 10 ft.(Toe boards).
- Tie to building every three section if narrow scaffold, if wide scaffold is use tie every four section high.
- Competent person (supervisor) must be on site at all times, when scaffold is being worked on, assembled, or disassembled.
- Use tags to control scaffolding (Green-go, Red-do not use!)

### **OSHA SCAFFOLDING STANDARD**

#### **1926.450 – SUBPART L**

#### **SCAFFOLDING**

#### **PURPOSE:**

- 1) Updates the existing standard to include types of scaffolds.
- 2) Allows flexibility in the use of fall protective systems
- 3) Simplifies language, eliminates duplication
- 4) Allows employers compliance flexibility

An estimated 2.3 million construction workers, or 65 percent of the construction industry, work on scaffolds frequently. Protecting these workers from scaffold-related accidents would prevent 4,500 injuries and 50 deaths every year, at a savings for American employers of \$90 million in workdays not lost



## **ORGANIZATION OF STANDARDS**

450. Scope, application and definitions applicable to subpart.

### **451. General requirements**

- 1) Capacity
- 2) Scaffold platform construction
- 3) Criteria for supported scaffolding
- 4) Suspension scaffolding (N/A to our class)
- 5) Access
- 6) Use
- 7) Fall Protection
- 8) Falling objects (Struck by hazards)**
- 9) 452. **Additional requirements to specific types of scaffolding.**
- 10) Fabricated frame scaffolds (tubular welded frame scaffolds. (Type we use!))
- 11) 453. Aerial lifts**
- 12) 454. Training Requirements**
- 13) Hazard recognize
- 14) Electrical hazards
- 15) Proper use
- 16) Maximum intended load
- 17) Pertinent requirements (452.(c.))
- 18) Training for erecting and dismantling
- 19) Nature of scaffolding hazards
- 20) Design criteria
- 21) When to retrain

**Appendix A – Scaffolding specifications**

**Appendix D – List of training topics for scaffold erectors and dismantlers.**

**Appendix E – Drawings and Illustrations**



## **GENERAL REQUIREMENTS:**

### **Capacity**

- Support own weight and 4 times maximum intended load
- Designed by a qualified person and built and loaded to design
- Scaffolding weight guideline:
  - Uprights 10 ft. apart = 25 lbs. per sq. ft.
  - Uprights 8 ft. apart = 50 lbs. per sq. ft.
  - Uprights 6 ft. apart = 75 lbs. per sq. ft.

### **Scaffolding Platforms (Planking)**

- Platforms fully planked or decked (Outriggers or walkways must also be fully planked)
- No more than 1 inch gaps
- Maximum openings of 9 ½ inches
- Scaffolding platforms and walkways a minimum of 18 inches wide
- Guardrails and / or personal fall arrest systems (PFAS) for platforms and runways not 18 inches wide
- Front edge of all platforms
  - No more than 14 inches from the face of the work
  - 3 inches from the face of work to outrigger scaffolds
  - 18" from the face for plastering and lathing operations
- Platforms 10 ft. long and less, planks to extend over the end of the support at least 6 inches but not more than 12 inches (over hang)
- Platforms greater than 10 ft. in length, no more than 18" past support
- Overlap platforms must be 12 inches over supports unless restrained to prevent movement
- On direction changes, any platform on a bearer at other than right angles shall be laid first, and platforms which rest at right angles over the same bearer laid second.
- No paint on wood, except edges that maybe marked or identification
- Fully planked between front upright and guardrail supports
- No mixed scaffolding components used, unless compatible and integrity maintained
- No modifications of scaffolding components



### **Criteria for supported scaffolds**

- Scaffolding higher than 4:1 ratio restrained from tipping by ties to building
- Bear on adequate foundations
  - Mud sills
  - Baseplates
- Plumbed and fully cross braced
  - Cross bracing / diagonal bases, or combination of bracing
- Cross bracing or diagonal bracing maybe used as a midrail or toprail, but not both
- Pins used if uplift could occur (If forklifts use a must)
- Scaffolding must be secured to the building once scaffolding is 30 ft. wide and 26 ft. high (if wider than 3 ft.) then be secured to the structure every 20 to 26 ft.
- If scaffold is covered with plastic, tarps etc., scaffolding must be secured to building regardless of height, to protect against wind
- Forklifts cannot be used to support scaffolding
- Scaffolding more than 125 ft. high must be designed by a Registered Professional Engineer

### **Suspension scaffolding (does not apply to our work.)**

#### **Access**

- Must have safe access
- No access by cross braces
- Bottom rung not more than 24 inches high
- Rest platforms at 35 ft intervals
- Sets access requirements for erectors and dismantlers
- Can use some end frames for access



### **Use**

- Checked by competent person prior to start of work
- Never overload
- No shore or lean-to scaffolds
- Inspected by a competent person
- Immediately removed or repaired,
- No horizontal movement
- Maintain clearance near power lines (min 10 ft)
- Can only be erected, moved, dismantled or altered under supervision of competent person
- No work on snow or ice covered platforms (planks)
- Tag lines used on swinging loads
- No work during storms, or high winds
- Debris shall not be allowed to accumulate
- Ladders shall not be used on scaffolds to increase height

### **Fall protection (PFAS or Guardrails)**

- 100% fall protection required at and above 10 ft.
- PFAS in lieu of guardrails
- Toprails must be between 38 and 45 inches high
- Use of crossbracing in lieu of top or midrails in some cases
- All sides and ends must be fall protected (only front or work area left open)

### **Falling objects protection**

- Hardhats required
- Protection of employees below
  - Cautioned off
  - Guarded by covers, canopies
  - Toe boards
  - Screens

**Five training areas**

- Nature of electrical, fall, and falling objects hazards
- Correct procedures for protection above
- Proper use of the scaffolding
- Load capacities of scaffolding
- Requirements of OSHA scaffolding Requirements – subpart L

**RETRAINING AS NECESSARY TO RESTOR PROFICIENCY**

**<< Competent Persons**

The competent person is **responsible for determining the safety and feasibility** of installing and using safe means of access, based on site conditions and the type of scaffold involved. [1926.451(e)(9)(i)]

**<< Erectors and Dismantlers**

Employers are required to **provide fall protection for employees** erecting or dismantling supported scaffolds where it is feasible, and where installing and using it does not create a greater hazard. [1926.451(g)(2)]

Critical to scaffolding safety are the use of competent persons for the design, erection/dismantling, and maintenance of scaffolds, and trained workers for their use. Therefore, assessing personnel abilities should be a part of all phases of the scaffolding inspection

