

RECOMMENDED SCAFFOLDING ERECTION PROCEDURE

Introduction

Guides to contractors, architects, engineers, dealers, etc., for the proper use of this equipment are deemed necessary, and for this reason the Steel Scaffolding and Shoring Institute has prepared this bulletin. Recommended Steel Scaffolding Safety Rules previously published by the Institute should be used in conjunction with this publication.

Nomenclature

1. **Accessories**—Those items other than frames and braces used to facilitate the construction of scaffolding towers and structures.
2. **Adjustment Screw**—Device composed of a threaded screw and an adjusting handle used for the vertical adjustment of the scaffolding.
3. **Base Plate**—A device used to distribute the leg load.
4. **Climbing Ladders**—A separate ladder attached to the scaffolding structure.
5. **Casters**—Wheels of a suitable dimension and unit designed to attach to the base of a tower and containing a brake to prevent the wheels from rotating.
6. **Coupling Pin**—Device used to connect lifts or tiers together vertically.
7. **Cross-bracing**—System of members connecting frames or panels of scaffolding to make a tower structure.
8. **Extension Device**—Any device used to obtain vertical adjustment of scaffolding other than an adjustment screw.
9. **Factor of Safety**—the ratio of ultimate load to the allowable load.
10. **Frame or Panel***—the principal prefabricated, welded structural unit.
11. **Guardrail**—A rail secured to uprights and erected along the exposed sides and ends of platforms.
12. **Horizontal Diagonal Bracing**—Diagonal braces running horizontally between frames of scaffolding.
13. **Lifts or Tiers***—The number of frames stacked one above each other in a vertical direction.
14. **Locking Device**—A device used to secure the cross brace to the panel.
15. **Putlog or Truss**—A separate horizontal load carrying member.
16. **Rolling Towers**—A composite structure of frames, braces, and accessories supported by casters.
17. **Safe Leg Load**—That load which can safely be directly imposed on the frame leg.
18. **Safe Scaffold Frame Horizontal Member Load**—That load which can safely be directly imposed on a horizontal member.
19. **Scaffolding Layout**—An engineered drawing prepared prior to erection showing arrangement of equipment for proper scaffolding use.
20. **Side Bracket**—A cantilevered arm unit, supported by the scaffolding frame.
21. **Sill or Mud Sill***—A footing, usually wood, which distributes the vertical loads to the ground.
22. **Toeboard**—A barrier secured along the sides and ends of a platform, to guard against the falling of material.
23. **Towers**—A composite structure of frames, braces, and accessories.
24. **Ultimate Load**—The maximum load which may be placed on the scaffolding causing failure by buckling of column members or yielding of some component.

Inspection of Scaffolding Equipment Prior to Erection

The three main areas of inspection are for rust, straightness of members and welds. This applies to all components of a scaffolding system.

1. **RUST**—Heavily rusted scaffolding equipment is a tell-tale sign of abuse or neglect.
2. **STRAIGHTNESS OF MEMBERS**—Mishandling, trucking and storing may **cause damage** to scaffolding equipment. All members or parts of all steel scaffolding components should be straight and free from bends, kinks or dents.
3. **WELDS**—Scaffolding equipment should be checked before use for damaged welds and any piece of equipment showing damaged welds or rewelding beyond the original factory weld should not be used. The factory weld reference pertains to location and quality of rewelds.

While **RUST, STRAIGHTNESS** and **WELDS** are of primary concern other component parts should be checked.

4. Locking devices on frames and braces shall be in good working order, and if not, must be repaired or replaced prior to use.
5. Coupling pins must effectively align the frame or panel legs.
6. Pivoted cross braces must have the center pivot securely in place.
7. Caster Brakes shall be in good working order and if not must be repaired or replaced prior to use.

Safe Bearing Loads For Soils

Considering that the allowable loads (bearing) on various soils and rock range from less than 1000 p.s.f. to more than 50,000 p.s.f., care should

be exercised in determining the capacity of the soil for every scaffolding job, realizing that weather conditions can turn an otherwise suitable ground condition into a hazardous situation. As an example, dry clay with an allowable bearing capacity of 8,000 p.s.f. could become very plastic after a rainfall and drop to less than 2,000 p.s.f.

Care should also be taken not to excessively disturb the soil. If fill is required in areas where scaffolding is used, a qualified engineer should be consulted as to materials and compaction.

Foundations

The purpose of a good foundation or mud sill is to distribute the scaffolding load over a suitable ground area. The size of the footing or sill is determined by the total load carried over a particular ground area, and by the nature of the soil supporting these sills.

The total load should be computed and the sills designed accordingly.

When scaffolding from earth or fill the area should be leveled and the sills spaced in a pattern assuring adequate stability for all scaffolding legs.

Planking and Accessories

Use only lumber that is properly inspected and graded for use as scaffold plank.

Planking shall have at least 12" of overlap and extend 6" beyond center of support or be cleated at both ends to prevent sliding off support. Do not allow unsupported ends of plank to extend an unsafe distance beyond supports. Secure plank to scaffolding when necessary.

All scaffolding accessories shall be used and installed in accordance with the manufacturer's recommended procedures. Accessories shall not be altered in the field.

When installing hanger or clamp supported putlogs (trusses), care should be taken to see that they extend at least 6" beyond the point of support. Also, make sure that the proper bracing is placed between putlogs (trusses). When the span between supporting members is more than 12' additional bracing between the putlogs (trusses) and the supporting members may be required. Do not cantilever or extend putlogs (trusses) as side brackets without thorough consideration for loads to be applied.

All brackets should be seated correctly with side brackets parallel to the frames and the end brackets at 90 degrees to the frame. Brackets shall not be bent or twisted from normal position.

Equip all planked or staged areas with proper guard rails and add toeboards when required.

Erection of Frames

The work of erecting the scaffolding should be under the supervision of a man with proper experience and aptitude for securing a safe installation, and who is familiar with the Scaffolding Safety Rules.

It shall be the responsibility of the man supervising the erection of the scaffolding to see that no damaged or deteriorated equipment is used in the setup. Should any scaffolding become damaged after the equipment has been erected, workmen shall not be allowed on same until the damaged items have been repaired or replaced.

Advance planning will help the erection of scaffolding to progress smoothly. The equipment should be unloaded as close to the area of use as possible and should be arranged in the order it is to be used. Adjustment screws should be set to their approximate final adjustment before setting up the scaffolding. At this time, a man should check to see that all panels which require coupling pins have them. Consult safety rules as recommended by the Institute.

After erecting the first tier of scaffold frames, plumb and level (using instruments) all frames so that no matter how high the final scaffolding setup, the additional frames will also be in correct alignment. As the erection proceeds, securely anchor all scaffolding to the structure at least every 30' of length and 25' of height. Free standing scaffold towers must be restrained from tipping by guying or other means.

When scaffolds are to be partially or fully enclosed, specific precautions must be taken to assure frequency and adequacy of ties attaching the scaffolding to the building due to increased load conditions resulting from effects of wind and weather. The scaffolding components to which the ties are attached must also be checked for additional loads.

Final Inspection of Erected Scaffolding

The following is a list of check points to be covered when making a final inspection of scaffolding prior to use. All points should be carefully checked to insure a safe and accident-free job and be periodically rechecked.

1. Check to see that there is proper support under every leg of every frame on the job. Check also for possible washout due to rain.
2. Check to make certain that all base plates or adjustment screws are in firm contact with their supports. All adjustment nuts should be snug against the legs of the frame.
3. Frames should be checked for plumbness in both directions.
4. If there is a gap between the lower end of one frame and the upper end of another frame it indicates that one adjustment screw must be adjusted to bring the frames in contact. If this does not help it indicates the frame is out of square and should be replaced.
5. All frames should be braced to at least one adjacent frame.
6. While checking the cross braces also check the locking devices to assure that they are all

* These terms can be used synonymously.

- in their closed position or that they are all tight.
7. Check to be certain that all planking and accessories are properly installed.
 8. Check to make certain all anchors are secured between the structure and the scaffolding.
 9. Check to be certain all guard rails are in place.
 10. If scaffolding is enclosed, check to see that additional precautions have been taken as noted in Section on Erection. Recheck periodically ties, clamps, etc., for movement.

Dismantling of Scaffolding

When dismantling the scaffolding, avoid dropping or throwing the components as this could result in damage to the equipment.

Erection of Rolling Towers

When erecting rolling scaffolding towers, the following additional items apply. These items are in addition to the applicable portions of the preceding sections.

1. Casters should be of adequate size in relation to the height of the tower, the surface over which the tower is to be used and in accordance with all government, state, and local codes, ordinances, and regulations.

Casters with plain stems shall be attached to the panel or adjustment screw by pins or other suitable means.

2. Do not extend adjusting screws on rolling towers more than 12".
3. The platform height shall not exceed four (4)* times the smallest base dimension unless guyed or otherwise stabilized.
4. Horizontal diagonal braces should be used near the bottom and at 20' intervals measured from the rolling surface.
5. When side brackets are used, consideration should be given to the overturning effect these brackets will have upon the stability of the tower.
6. Cross brace every lift—both sides.
7. The addition of ladders to the tower will provide a convenient climbing device.
8. Install guardrails.
9. Plank according to Plank and Accessories Section of Erection Procedure.

* EXCEPTIONS: three times in California, Ohio, Oregon, Montana, Maine; 3½ times in Washington.

Final Inspection Of Rolling Towers

The following additional points should be checked when making a final inspection of rolling scaffold towers prior to their use. These points are in addition to the applicable items covered under the preceding section entitled, "Final Inspection of Erected Scaffolding."

1. Check to see that the platform height does not exceed four (4) times the smallest base dimension unless the tower is properly guyed or otherwise stabilized.
2. Check to see that, if adjusting screws have been used, they are not extended more than 12".
3. Check to make sure the caster brakes are in good working condition and are applied when tower is not being moved.
4. Inspect to make sure horizontal diagonal bracing has been placed near the bottom, top, and at 20' intervals measured from the rolling surface.
5. Cross bracing has been installed on both sides of every lift.
6. Check the area in which the tower is to be used to insure there are no obstructions either in, on, or above the floor which will interfere with the proper and safe use of the rolling tower.
7. Check for Guardrails.
8. Check to see that all planking is properly installed.

REFER TO STEEL SCAFFOLDING AND SHORING INSTITUTE STEEL SCAFFOLDING SAFETY RULES BEFORE USING SCAFFOLDING.

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Form No. SSI-80-68 Printed In U.S.A.