



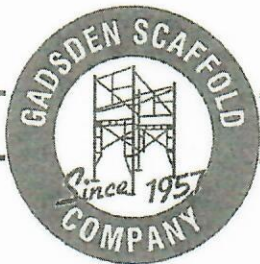
Estimating Scaffold Requirements

How to estimate your scaffold requirements (using the chart below):

Find the height you need. Check the column under the height of the frame you are using until you come to the total height you want to reach. Note the number of frames high (in 1st column). Look across top line to total length your scaffold must extend. Look down the column until you are opposite the number of frames high you located first. The top figure is the number of frames you need and the bottom figure is the number of braces.

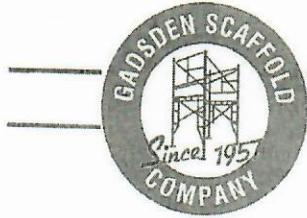
No. Frames High	Using Standard SP07 Stack Pins				Using SP09 Stack Pins with 1" collar				No. Required	Length Based on 7' Spacing																																														
	4' Frames	4'-6" Frames	5' Frames	6'-6" Frames	4' Frames	4'-6" Frames	5' Frames	6'-6" Frames		7'	14'	21'	28'	35'	42'	49'	56'	63'	70'	77'	84'	91'	98'	105'	112'	119'	126'	133'	140'	147'	154'	161'																								
										Frames	Braces																																													
1	4'	4'6"	5'	6'6"	4'	4'6"	5'	6'6"	Frames	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Braces	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46
2	8'	9'	10'	13'	8'1"	9'1"	10'1"	13'1"	Frames	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	Braces	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92
3	12'	13'6"	15'	19'6"	12'2"	13'7"	15'2"	19'7"	Frames	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	Braces	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138
4	16'	18'	20'	26'	16'3"	18'8"	20'3"	26'3"	Frames	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	Braces	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	168	176	184
5	20'	22'6"	25'	32'6"	20'4"	23'2"	25'4"	32'7"	Frames	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	Braces	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230
6	24'	27'	30'	39'	24'5"	27'3"	30'5"	39'5"	Frames	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	Braces	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276
7	28'	31'6"	35'	45'6"	28'6"	31'9"	35'6"	45'7"	Frames	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147	154	161	168	Braces	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224	238	252	266	280	294	308	322
8	32'	36'	40'	52'	32'7"	36'10"	40'7"	52'7"	Frames	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	168	176	184	192	Braces	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320	336	352	368
9	36'	40'6"	45'	58'6"	36'8"	41'4"	45'8"	58'7"	Frames	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180	189	198	207	216	Braces	18	36	54	72	90	108	126	144	162	180	198	216	234	252	270	288	306	324	342	360	378	396	414
10	40'	45'	50'	65'	40'9"	45'5"	50'9"	65'7"	Frames	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	Braces	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460
11	44'	49'6"	55'	72'	44'10"	49'11"	55'10"	71'7"	Frames	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220	231	242	253	264	Braces	22	44	66	88	110	132	154	176	198	220	242	264	286	308	330	352	374	396	418	440	462	484	506
12	48'	54'	60'	78'6"	48'11"	55'	60'11"	78'11"	Frames	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	Braces	24	48	72	96	120	144	168	192	216	240	264	288	312	336	360	384	408	432	456	480	504	528	552
13	52'	58'6"	65'	85'	53'	58'7"	66'	84'7"	Frames	26	39	52	65	78	91	104	117	130	143	156	169	182	195	208	221	234	247	260	273	286	299	312	Braces	26	52	78	104	130	156	182	208	234	260	286	312	338	364	390	416	442	468	494	520	546	572	598
14	56'	63'	70'	91'6"	57'1"	63'8"	71'1"	92'	Frames	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224	238	252	266	280	294	308	322	336	Braces	28	56	84	112	140	168	196	224	252	280	308	336	364	392	420	448	476	504	532	560	588	616	644
15	60'	67'6"	75'	98'	61'2"	68'5"	76'2"	98'7"	Frames	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	Braces	30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480	510	540	570	600	630	660	690

SCAFFOLD SAFETY INFORMATION



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SCAFFOLD SAFETY INFORMATION

THE PROPER AND SAFE USE OF SCAFFOLDING IS YOUR RESPONSIBILITY

The improper assembly or use of scaffold and scaffold accessories can lead to serious injury or even death. It is your responsibility to read and understand this information before assembling and using scaffold and scaffold accessories.

Gadsden Scaffold is pleased to provide you with this packet of scaffold safety information. We strongly encourage you to thoroughly read the enclosed materials before attempting to assemble and use scaffold and scaffold accessories.

1. Instructions for erecting rolling or stationary scaffold towers
2. Scaffold specifications
3. SIA Code of Safe Practices
4. Importance of Baseplates
5. Importance of Bracing
6. Recommended Procedures for Visual Inspection
7. OSHA Quick Card
8. Scaffold Load Sheet

All of these documents should be copied and provided to anyone assembling or using scaffold purchased from Gadsden Scaffold.

Please feel free to reproduce and distribute these safety materials. The promotion of scaffold safety is in everyone's interest.

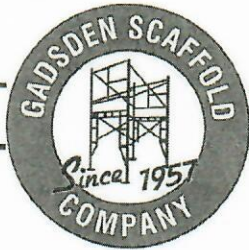
The information provided in this packet cannot cover every possible scenario involving the use of scaffold and scaffold accessories, and is therefore not all-inclusive. For more information regarding the safe assembly and use of scaffold and the accessories, please refer to the following websites:

OSHA-www.osha.gov/SLTC/scaffolding/

www.osha.gov/publications/osha3150.pdf

Scaffolding, Shoring and Forming Institute, Inc. -www.ssfi.org/safety.htm

Also, check with your local and state authorities regarding scaffold safety requirements.



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Operation and Safety Guide For Erecting Rolling or Stationary Scaffold Towers

Safety Practices:

Inspect scaffold towers daily for defects or damage before each use.

Failure to do so could result in injury or death.

When standing on top of a scaffold tower, do not push, pull or apply force horizontally against any object or structure.

Do not stand on or attach any equipment to cross braces or diagonal braces. **Doing so could result in serious injury or death.**

Do not stand or sit on guardrails.

Scaffold must be mounted to base plates or casters and must be supported to a permanent surface to prevent slippage or sinking.

Workloads must not exceed the load capacity of the scaffold. Refer to the scaffold load sheet. Work load must be distributed evenly on the scaffold platforms.

Keep scaffold away from electrical hazards. **Failure to do so could result in injury or death.**

When hoisting material, scaffold must be attached to a permanent structure to prevent tipping.

Never ride a moving scaffold.

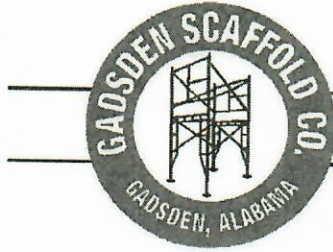
Do not allow children or anyone to play on the scaffold structure.

Do not use scaffold in inclement weather including high winds, lightning, rain, snow and ice.

Never use cross braces for support of scaffold platforms.

STEP	ACTION
1	Before starting scaffold erection, check all parts for visible damage assuring all parts are in good working condition. Any part that does not appear to be in good working condition must be replaced.
2	Have one person hold one end frame with the coupling pins attached in the upright position. Have a second person attach two cross braces to the brace locks, one brace to each side. Next attach the second frame to the cross braces. Make sure all cross braces are locked in.
3	If casters are being used insert into frame leg and secure with gravity lock. make sure to set the brake on the caster. If leveling jacks are used, insert the threaded rod into the scaffold frame leg. Do not adjust the scaffold frame more than 12 inches off the ground.
4	Outriggers and diagonal braces are mandatory on towers 15' or higher. Attach casters or leveling jacks (whichever is applicable) to the outriggers and secure them to the scaffold frame using clamps provided. If outriggers are not used the tower must be anchored to the wall using wall tie arms. One end of the wall tie arm is mounted to a permanent structure and the other end is clamped to the scaffold.
5	Install three scaffold platforms side by side to the top horizontal frame of the scaffold frames. Secure platforms in place to prevent wind uplift.
6	Adding Tower Height: Add additional end frames by installing bottom of additional frames onto the coupling pins located on the top of the frames previously erected. Secure the added frames in place with gravity pins. Be sure to install the end frames in such a manner as the ladder steps on each frame are in line with each other. Move the scaffold platforms from the originally installed end frames to the new frames.
7	After reaching the desired height, install guardrails. The guardrail panels are installed onto the top coupling pins and held in place with gravity locks. 4" gravity locks are then used to tie the panels together.
8	After moving a rolling tower, be sure to set the brakes on the casters to prevent further movement.

*Please feel free to reproduce and distribute this document.
Scaffold safety is in everyone's best interest.*



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To Whom It May Concern:

Subject: Scaffold Specifications

Our tubular welded scaffold end frames have the following specifications:

Height: Standard frames range in height from 2' to 6'6"

Width: Standard end frames 60" center to center of upright

Braces lock spacing: 36" on center of all frames 4' or greater

Materials used:

Uprights constructed from 1.625" 13 gauge high strength tubes. Steel has minimum yield strength of 55,000 lbs and a tensile strength of 65,000. Elongation factor of no less than 15%. Each leg is load rated at 4,000 lbs with a 4:1 safety margin. Our design criteria exceeds 75 lbs per square foot.

Cross members are constructed from 1.625" 13 gauge high strength tube. This steel has minimum yield strength of 50,000 lbs and a tensile strength of 60,000 lbs.

All other pieces are constructed from 1.250" 14 gauge tube with minimum yield strength of 38,000 lbs and a tensile strength of 52,000 lbs.

Braces are attached to scaffold by means of our gravity lock system. This system is pictured in our catalog.

Our pivoted cross braces are made from a 1.050" galvanized 14 gauge tubing with minimum yield strength of 38,000 lbs and a tensile strength of 52,000 lbs.

Safety load ratings for the following items:

A-7 7' aluminum catwalks

Or

A-7P 7' aluminum plywood catwalks

75 lbs/square foot

E-DB92-8 8" casters

500 lbs each

SS150 or SS165 stair sections

500 lbs each

EB120-T extension brackets

500 lbs each

J306 base plate leveling jacks

9000 lbs each

J305 tube style leveling jacks

7000 lbs each

SP75 shoring post

4000 lbs each

All the above items are rated with a built in 4:1 safety margin.

All the above items are rated for live or dead load.

If you have need of further information concerning our product line please call us at 1-800-538-1780 or 1-256-547-6918.

Thank You,
Gadsden Scaffold Company, Inc.

**CODE OF SAFE PRACTICES FOR
FRAME SCAFFOLDS, SYSTEM SCAFFOLDS,
TUBE AND CLAMP SCAFFOLDS & ROLLING SCAFFOLDS
DEVELOPED FOR INDUSTRY BY THE SCAFFOLDING, SHORING & FORMING INSTITUTE (SSFI)
and THE SCAFFOLD & ACCESS INDUSTRY ASSOCIATION, INC. (SAIA)**

It shall be the responsibility of all users to read and comply with the following common sense guidelines which are designed to promote safety in the erecting, dismantling, alteration and use of Scaffolds. These guidelines do not purport to be all inclusive nor to supplant or replace other traditional safety and precautionary measures. If these guidelines in any way conflict with any state, local, provincial, federal or other government statute or regulation, said statute or regulation shall supersede these guidelines and it shall be the responsibility of each user to comply therewith.

I. GENERAL GUIDELINES

- A. POST THESE SCAFFOLD SAFETY GUIDELINES** in a conspicuous place and be sure that all persons who erect, dismantle, or use scaffolds are aware of them. Use them in tool box safety meetings.
- B. COMPLY WITH ALL STATE, LOCAL AND FEDERAL CODES, ORDINANCES AND REGULATIONS** pertaining to scaffolds.
- C. SURVEY THE JOB SITE.** A survey shall be made of the job site by a competent person for hazards, such as non-compacted earth fills, ditches, debris, electrical lines, unguarded openings, and other hazardous conditions created by other trades. These conditions should be corrected or avoided as noted in the following sections.
- D. INSPECT ALL EQUIPMENT BEFORE EACH USE.** Never use any scaffold component that is damaged or defective. Mark it or tag it as damaged or defective and remove it from service.
- E. ERECT SCAFFOLDS IN ACCORDANCE WITH DESIGN AND/OR MANUFACTURERS RECOMMENDATIONS.**
- F. DO NOT ERECT, DISMANTLE OR ALTER A SCAFFOLD** except under the supervision of a competent person qualified in scaffold construction.
- G. DO NOT ABUSE OR MISUSE THE SCAFFOLD.**
- H. MAINTAIN THE SCAFFOLD IN A SAFE CONDITION.** Stop work and report any unsafe conditions to your supervisor.
- I. NEVER TAKE CHANCES!** If in doubt regarding the safety, or use of the scaffold, consult a qualified person.
- J. NEVER USE THE SCAFFOLD FOR PURPOSES OR INWAYS FOR WHICH IT WAS NOT DESIGNED.**
- K. DO NOT WORK ON SCAFFOLDS** if you are physical unable to do so.
- L. DO NOT WORK UNDER THE INFLUENCE** of alcohol or drugs.
- M. FALL PROTECTION** - Never work on a scaffold that has open sided platforms; use a guardrail or personal fall protection system when required by applicable codes or site requirements.
- N. DO NOT ERECT, DISMANTLE, ALTER OR WORK ON SCAFFOLDS DURING STORMS OR HIGH WINDS, AS DETERMINED BY THE COMPETENT PERSON.**

II. GUIDELINES FOR ERECTION AND USE OF SCAFFOLDS

- A. STATIONARY SCAFFOLD LEGS SHALL BE SET ON BASE PLATES ON AN ADEQUATE FIRM FOUNDATION.** Install sills as necessary to distribute the leg loads to the foundation; secure base plates to the sills as required. Any part of a building or structure used to support the scaffold shall be capable of supporting the maximum intended load.
- B. USE ADJUSTING SCREWJACKS** or other approved methods to adjust to uneven grade conditions.
- C. BRACING, LEVELING & PLUMBING OF SCAFFOLDS**
 - 1. Plumb and level all scaffolds as erection proceeds. Do not force scaffold components together.

2. Each frame or panel shall be braced by horizontal bracing, cross bracing, diagonal bracing or a combination thereof for securing vertical members together laterally. All brace connections shall be properly secured, in accordance with the manufacturer's recommendations.
 3. Install bracing as erection proceeds, in accordance with the manufacturer's recommendations.
 4. Joints shall be secured as required to prevent separation.
- D. MAKE SURE SCAFFOLDS ARE STABLE.** Free standing scaffolds exceeding the allowable the height to base ratio must be restrained from tipping.
- E. SECURE THE SCAFFOLD TO A SUBSTANTIAL STRUCTURE,** when the scaffold exceeds the maximum allowable height. Ties must prevent the scaffold from tipping either into or away from the structure. Install ties as close as practicable where horizontal members connect to vertical legs.
- F. WHEN SCAFFOLDS ARE FULLY OR PARTIALLY ENCLOSED,** or when scaffolds are subjected to overturning forces, additional ties may be required; consult a qualified person.
- G. DO NOT ERECT OR USE SCAFFOLD NEAR LIVE POWERLINES** unless proper precautions are taken. Consult the power service company for advice.
- H. INSTALL SAFE ACCESS FOR ALL SCAFFOLD PLATFORMS.** This includes ladders, stairways, direct access, ramps and walkways. Do not climb scaffold components not intended for access, such as braces, rosettes, rings, cups and clamps.
- I. PROVIDE A GUARDRAIL OR PERSONAL FALL PROTECTION SYSTEM** when the platform height exceeds unprotected limits. (Check applicable regulations for permissible unprotected limits, but never more than 10 feet.)
- IA. INSTALL FALLING OBJECT PROTECTION** when required by regulations.
- J. BRACKETS AND CANTILEVERED PLATFORMS**
1. Cantilevered scaffolds platforms shall be installed and used as designed by a qualified person.
 2. All scaffold brackets shall be installed and used in accordance with manufacturer's recommendations. Brackets are to be used only as work platforms and shall not be used for storage of material or equipment unless designed for such use by a qualified engineer.
- K. SCAFFOLD COMPONENTS** shall be installed and used in accordance with the qualified persons design. Components shall not be altered. Scaffold components from more than one manufacture shall not be intermixed, unless the component parts have equivalent strength, readily fit together and the resulting scaffold's structural integrity is maintained.
- L. PLATFORMS**
1. Scaffold platforms shall be at least 18 inches wide. Only planking and decking meeting scaffold use requirements shall be used. Platforms shall be properly supported.
 2. Check each platform prior to use. Make sure platform units are not warped, damaged, or otherwise unsafe.
 3. Planks shall have at least 12" overlap unless restrained.
 4. Planks including Solid sawn lumber, Laminated lumber, modular, composite, or fabricated scaffold planks and platforms shall extend over their end supports not less than 6" unless restrained. Excess overhang is prohibited unless barricaded to prevent access.
 5. Do not store materials or accumulate debris that could overload the scaffold.
- M. FOR "PUTLOGS" AND "TRUSSES" THE FOLLOWING ADDITIONAL GUIDELINES APPLY:**
1. Install and brace putlogs and trusses in accordance with the design.
 2. Do not cantilever or extend putlogs/trusses except as designed by a qualified person.
- N. FOR ROLLING SCAFFOLDS THE FOLLOWING ADDITIONAL GUIDELINES APPLY:**
1. **RIDING A ROLLING SCAFFOLD IS VERY HAZARDOUS. The SSFI and the SAIA, DO NOT** recommend nor encourage this practice.
 2. Rolling scaffolds should be used on hard level surfaces.
 3. Casters with plain stems shall be secured to the frames or adjustment screws by pins or other suitable means.
 4. A minimum 12 inches of screwjack shall extend into the scaffold leg or secured from sliding out.
 5. Wheels or casters shall be locked to prevent caster rotation and scaffold movement when scaffold is in use.

6. Joints shall be restrained from separation.
7. Use horizontal diagonal bracing or equivalent means near the bottom and at 20 foot intervals measured from the rolling surface.
8. Do not use brackets or other platform extensions without compensating for the overturning effect.
9. Secure or remove all materials and equipment from platform before moving the scaffold.
10. Do not attempt to move a rolling scaffold without sufficient help – watch out for holes in floor and overhead obstructions. Stabilize against tipping.

O. SAFE USE OF SCAFFOLD

1. Prior to use, inspect scaffold to insure it has not been altered and is in a safe working condition regardless of what the tag might state.
2. Erected scaffolds and platforms should be inspected regularly by those using them prior to each work shift and after any occurrences that may alter the scaffold from a safe condition.
3. Exercise caution when entering or exiting a work platform.
4. Do not overload scaffold. Follow manufacturer's safe working load recommendations and the design.
5. Do not jump onto platforms.
6. **DO NOT USE** ladders or makeshift devices to increase the working height of a scaffold. Do not plank guardrails to increase the height of a scaffold.
7. Use proper access.

III. WHEN DISMANTLING SCAFFOLDING THE FOLLOWING GUIDELINES APPLY:

- A. Inspect the scaffold to make sure it is structurally stable. If unstable, do not start dismantling the scaffold prior to stabilizing it.
- B. Do not remove ties until the scaffold has been dismantled to that level.
- B. Visually inspect platform units prior to dismantling to be sure they are safe and secure.
- C. Do not remove a scaffold component without considering the effect of that removal.
- D. Do not accumulate excess components or equipment on the level being dismantled.
- E. Lower dismantled components in an orderly manner. Do not throw off the scaffold.
- F. Dismantled equipment should be stockpiled in an orderly manner.
- G. Defective components must be tagged and kept separate.

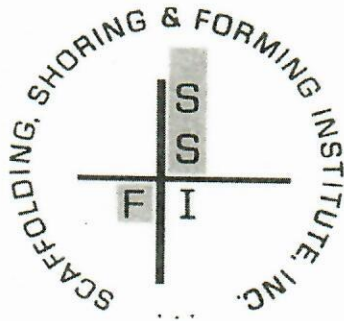
Since field conditions vary and are beyond the control of the SSFI and the SAIA, safe and proper use of scaffolding is the sole responsibility of the user.

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SCAFFOLDING SECTION

SSFI TECHNICAL BULLETIN

Importance of Baseplates

All supported scaffolds will ultimately transmit their live and dead loads to the surface upon which the scaffold rests. For this reason, the foundation of a scaffold is arguably the most important part of a safe scaffold.

Federal OSHA regulations, 29CFR1926.451(c)(2), require that "Supported scaffold poles, legs, posts, frames, and uprights shall bear on base plates and mud sills or other adequate firm foundation". There has been some confusion as to what this means. Some believe it says that you need either a base plate below each leg or you can use a mud sill or other adequate firm foundation. This is not correct and, in fact, can be dangerous. The paragraph really is saying that there are two things required below each scaffold leg: 1) a base plate, and 2) a mud sill or other adequate firm foundation.

How do we know this is what OSHA intended? OSHA's compliance directive, CPL 02-01-023, for Subpart L, Scaffolds, makes it pretty clear. Paragraph K.3.b states that the regulations require the use of both base plates **and** mud sills or other adequate firm foundation. The emphasis on "and" is OSHA's. In addition, subparagraph (1) simply states "Base plates are always required". You really can not get much more clear than that.

Why are base plates required? If the scaffold is built on a concrete slab, why can't I just put a plywood pad directly below the leg without a base plate? This brings up a subparagraph to 1926.451(c)(2). In 1926.451(c)(2)(i), the regulations require that the footing shall be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement. The only way to prevent settling or displacement is to make sure the load is spread out over a large enough area. Putting a leg directly on a plywood pad or wood sill will focus all the scaffold load onto a very small area and cause the leg to bite or sink into the wood. This is settling.

The following calculations for a plywood pad show that even with a good quality grade of plywood, the allowable leg load is only 162 pounds. This is the total load; dead load of the scaffold and platform and the imposed live load. The cross-sectional area of a typical scaffold leg is, at most, about one-half of a square inch. This provides only a very small contact area between the bottom of the scaffold leg and the

This Technical Bulletin was prepared by members of the SSFI Scaffolding Section.

SSFI is a trade association comprising manufacturers of scaffolding, shoring, forming, and suspended scaffolding. The institute focuses on engineering and safety aspects of scope products.

This bulletin does not purport to be all-inclusive nor to supplant or replace other additional safety and precautionary measures to cover usual or unusual conditions. If this bulletin conflicts in any way with a state, local, federal or other government statute or regulation, said statute or regulation shall supersede this bulletin and it shall be the responsibility of each user to comply therewith. This bulletin has been developed as an aid to users of scaffolding equipment. SSFI is not responsible for the use of this bulletin.

plywood. The leg will crush the wood fibers and cut into the plywood creating an indentation. Using a base plate will distribute the leg load to a much larger area, typically about 6" by 6", or 36 square inches.

Placing a scaffold leg directly onto a concrete slab is also not allowed. The compressive strength of concrete is generally in the 3000 – 5000 psi range. Using an average of 4000 psi, the allowable load capacity of a scaffold leg on concrete would be $4000 \times 0.476 = 1904$ pounds. While this is much greater than a scaffold leg on plywood, it is still less than the typical capacities of scaffold legs.

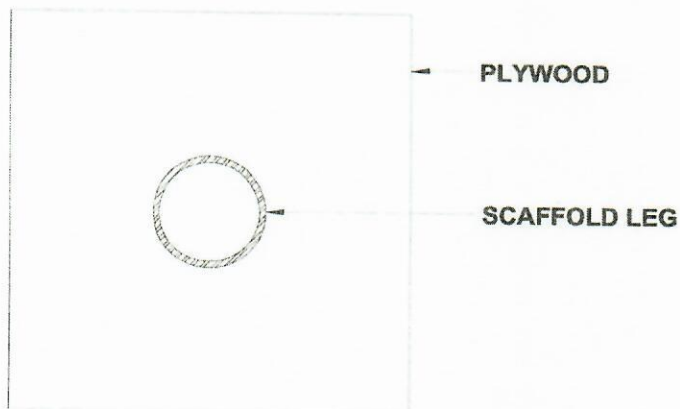
Always use base plates or screw jacks with base plates on all scaffolds. Scaffolds built on concrete slabs will generally not need a sill but scaffolds built on the ground (whether asphalt, grass, backfill, etc) will require a mud sill. How big must the mud sill be? Large enough to support the scaffold load without settling. Check with a qualified person if necessary.

Plywood Calculations

Assume APA Marine Exterior Plywood
Veneer Grade A
Grade Stress Level 1
Species Group 1

From APA Plywood Design Specification:

Bearing (on face perpendicular to plane of plies)
 $F_{c\perp} = 340$ psi (dry)
210 psi (wet)



Scaffold Leg Area:

Tube OD = 1.69"
Wall Thickness = 0.095"
Tube ID = 1.50"

$$\text{Area } A = (D^2 - d^2) 3.14 / 4 = (1.69^2 - 1.5^2) 3.14 / 4 = 0.476 \text{ sq. in.}$$

Maximum Allowable Load on Plywood:

$$P_{\text{DRY}} = 340 \times 0.476 = 162\#$$

$$P_{\text{WET}} = 210 \times 0.476 = 100\#$$

This Technical Bulletin was prepared by members of the SSFI Scaffolding Section.



SCAFFOLDING SECTION

SSFI TECHNICAL BULLETIN

Importance of Bracing

When erecting any scaffold, some thought must be given to the bracing that will be required. A brace, in simple terms, is a structural member used to stiffen a structure. The bracing required for a particular scaffold will depend on the type of scaffold used and the manufacturer's design. There are some types of scaffolds where crossbracing is not required; however, the need for bracing, or "stiffening", of the scaffold structure is present for all scaffolds.

A triangle is the most rigid geometric shape. A square or rectangle without a diagonal brace will easily collapse. Imagine a cardboard box with the top and bottom flaps opened up. The box will parallelogram, or flatten, easily. The box will not retain its shape. Similarly, a single scaffold bay built with only horizontals connecting the legs will not be rigid. It could easily parallelogram.

Federal OSHA requires, in 29CFR1926.451(c)(3), that scaffold legs be plumb and braced to prevent swaying and displacement. This bracing is accomplished with a combination of horizontal and diagonal members. Also, on fabricated frame scaffolds, OSHA requires, in 29CFR1926.452(c)(2), that frames are braced by cross, horizontal or diagonal braces, or a combination thereof, which secure vertical members together laterally. The cross braces must automatically square and align vertical members so the scaffold stays plumb, level and square.

All scaffolds, whether fabricated frames, tube and coupler, system or Euro-style frames, need to be properly braced. As the OSHA regulations state, braces serve several purposes. They secure the vertical members (legs) together. They square and align the legs so the scaffold stays plumb. And they resist sway forces that result from horizontal loads imposed on scaffolds from wind and worker movement.

Fabricated frame scaffolds require the use of crossbraces. In addition to squaring and aligning the legs, they reduce the unbraced length of the leg, thereby giving the frame a higher load capacity than it would otherwise have. Tube and coupler scaffolds use continuous diagonal face bracing and transverse X-bracing for rigidity. System and Euro-style frame scaffolds are proprietary scaffold systems. The required bracing will be specified by the manufacturer.

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Importance of Bracing

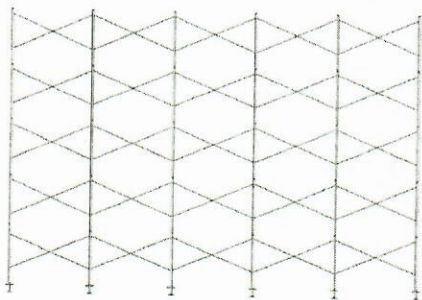
Removal of braces is a common occurrence on work sites to allow better access to the wall surface. On fabricated frame scaffolds, some crossbraces may be removed; however, removal of crossbraces will depend upon a number of factors, including the height of the scaffold, number of planked levels, number of active work levels, type and location of ties, among others. Check with the manufacturer or a qualified person before removing braces. Various bracing patterns can be used to leave every other bay open, but generally crossbraces must be left in place.

Tube and coupler, system and Euro-style frame scaffolds are braced differently than fabricated frame scaffolds. The number of crossbraces on the typical fabricated scaffold provides a level of redundancy that is not present on other types of scaffolds. Before attempting to remove braces on tube and coupler, system or Euro-style frame scaffolds, check with the manufacturer or a qualified person.

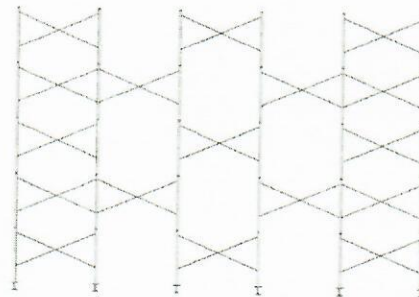
All scaffolds must be erected under the supervision of a competent person (29CFR1926.451(f)(7)). OSHA also requires, in 29CFR1926.454(b), that all persons involved in erecting scaffolds be trained in the correct procedures for erecting the type of scaffold in question. This will help to ensure that the scaffold will be erected according to applicable regulations and manufacturer's instructions. For more information, consult the latest editions of the following OSHA and ANSI standards.

- 29CFR1926, Subpart L (OSHA scaffold standards)
- ANSI A10.8

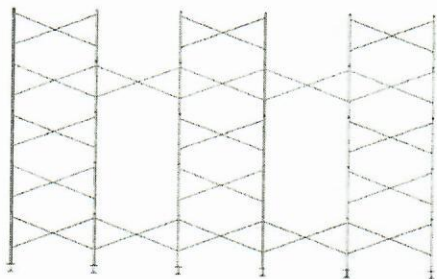
Fabricated frame scaffold crossbracing options:



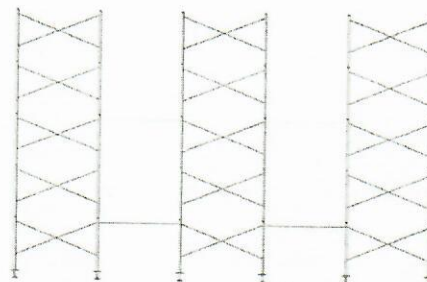
Full Bracing



Skip (Checkerboard) Bracing



Tower Bracing (with crossbraces)



Tower Bracing (with rails)



SCAFFOLDING SECTION

SSFI RECOMMENDED PROCEDURE

Recommended Procedures for Visual Inspection of Welded Tubular Frame Scaffolding & Accessories

This document provides recommended procedures for visual inspection of steel and aluminum frame scaffolding equipment and is not intended for other materials such as wood products. The following are general guidelines. Contact the manufacturer for specific guidelines.

Visual Inspection

Inspection teams must be thoroughly trained to recognize the following possible defects or unsafe conditions present in scaffold frames and accessories regardless of age or source:

Frames

1. Cracked or broken welds
2. Missing members, legs or crossmembers
3. Split or cracked tube
4. Holes in legs or crossmembers due to cutting or cutting torch activity
5. Evidence of extreme heat
6. Extra or deformed holes
7. Missing or inoperable cross brace lock devices
8. Tubular members out of round or deviations from normal cross section
9. Bent crossmembers or legs, including dents and dimples
10. Squareness or warp of frames, ledger frames and major components
11. Excessive corrosion such as pitting or flaking – Corrosion can affect the overall strength of the product due to loss of cross sectional area
12. Discoloration due to possible exposure to caustic chemicals
13. Evidence of field welding or modification

Crossbraces

1. Bends or kinks in braces
2. Damaged or excessively loose pivot
3. Splits or cracks in braces
4. Holes in braces due to cutting or cutting torch activity
5. Evidence of extreme heat
6. Excessive corrosion such as pitting or flaking
7. Missing connecting hardware
8. Discoloration due to possible exposure to caustic chemicals
9. Evidence of field welding or modification

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**Recommended Procedures for Visual Inspection of
Welded Tubular Frame Scaffolding & Accessories**

Sidewall Brackets

1. Cracked or broken welds
2. Missing members
3. Missing fasteners (rivets, bolts)
4. Holes in members due to cutting or cutting torch activity
5. Evidence of extreme heat
6. Extra or deformed holes
7. Missing or damaged hooks or connecting devices
8. Bends or kinks in members
9. Squareness or warp of brackets
10. Excessive corrosion such as pitting or flaking
11. Discoloration due to possible exposure to caustic chemicals
12. Evidence of field welding or modification

Screw Jacks / Base Plates

1. Splits or cracks in leg material
2. Damaged threads
3. Excessively loose adjusting nuts
4. Cracked or damaged adjusting nuts
5. Cracked or broken welds at attached base plates
6. Evidence of extreme heat
7. Straightness of legs
8. Excessive corrosion such as pitting or flaking
9. Discoloration due to possible exposure to caustic chemicals
10. Evidence of field welding or modification

Various jigs and fixtures can be assembled to inspect and check the frames and accessories.

If you have any questions regarding the safety of a scaffold frame or accessory, contact the manufacturer.

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OSHA QUICK CARD™

Supported Scaffold Safety Tips

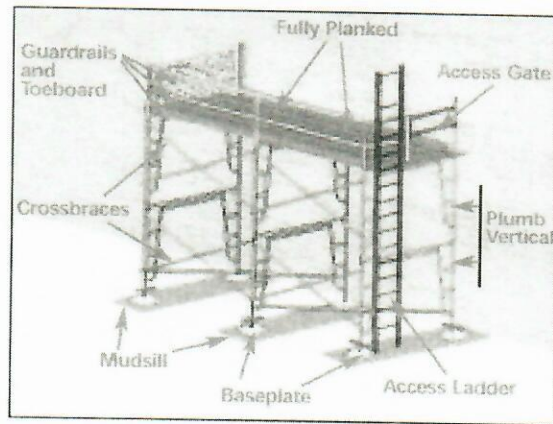
Supported scaffolds consist of one or more platforms supported by outrigger beams, brackets, poles, legs, uprights, posts, frames, or similar rigid support.

Guardrails or personal fall arrest systems for fall prevention/protection are required for workers on platforms 10 feet or higher.

Working platforms/decks must be planked close to the guardrails.

Planks are to be overlapped on a support at least 6 inches, but not more than 12 inches.

Legs, posts, frames, poles, and uprights must be on base plates and mud sills, or a firm foundation; and, be plumb and braced.



Scaffold user training must include:

- The hazards of type of scaffold being used;
- Maximum intended load and capacity;
- Recognizing and reporting defects;
- Fall hazards;
- Electrical hazards including overhead lines;
- Falling object hazards;
- Other hazards that may be encountered.

OSHA Occupational
Safety and Health
Administration

U.S. Department of Labor

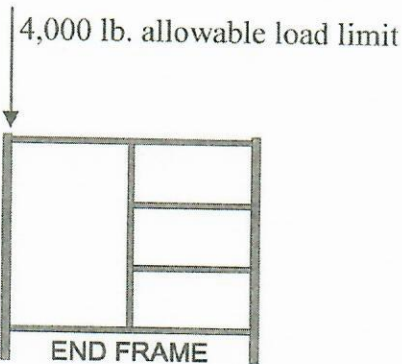
www.osha.gov (800) 321-OSHA



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SCAFFOLD LOAD SHEET



8" Caster
500 lb capacity

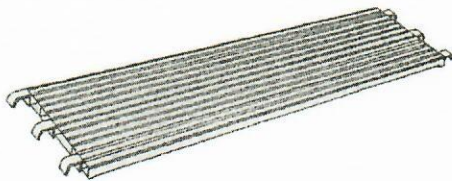
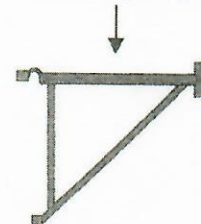


Tube Style Screw Jack
7000 lb capacity

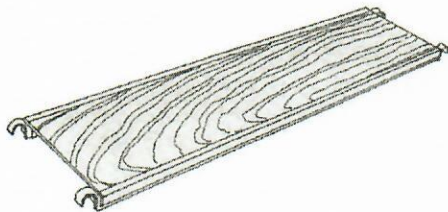


Base Plate Screw Jack
9000 lb capacity

21" Extension Bracket
500 lb capacity



All Aluminum Platform
75 lb/sq ft capacity



Aluminum/Plywood Platform
75 lb/sq ft capacity

This chart reflects a 4 to 1 minimum safety factor as required by the Federal Occupational Safety and Health act regulations and as recommended by the Scaffold Industry Association. Work loads on the scaffold tower must not exceed the load capacity of the lowest rated component. Work load must be distributed evenly on the scaffold platform.