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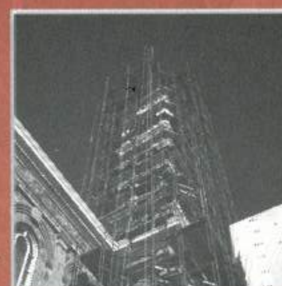
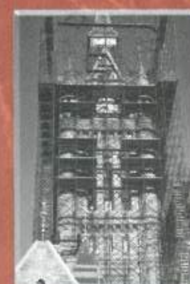
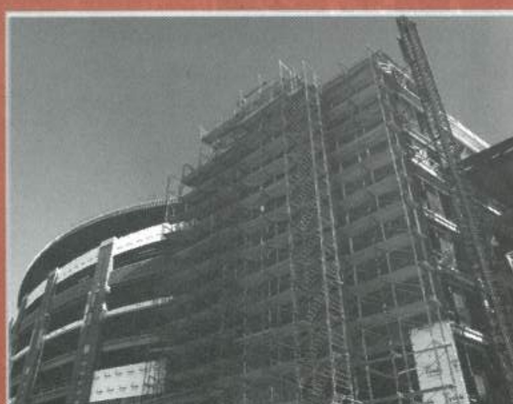
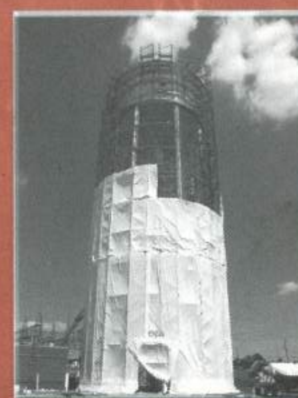
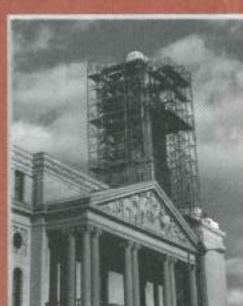
WACO®
Scaffolding & Equipment

GUIDE TO SCAFFOLDING

THE INDUSTRY STANDARD FOR OVER 50 YEARS

WACO'S GUIDE TO SCAFFOLDING

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PREFACE

SCOPE OF "WACO'S GUIDE TO SCAFFOLDING"

This booklet is an assembly of information on the use of scaffolding which is intended to help users understand how to better use Waco Scaffolding. It does not purport to be an authority on scaffolding, nor is it all-inclusive. While every effort has been made to ensure the accuracy of the contents of this catalogue, we do not accept responsibility for any errors which may occur herein or any losses of any nature that may be incurred.

It is written in general terms and does not always specify the Waco part numbers. There was no intent either implied or stated to cover products manufactured by other manufacturers.

Nor is this guide intended to supersede or override any federal, state, local or company regulations.

Scaffold users must, at all times, work safely and within the guidelines set down by regulatory bodies and Waco.

SECTION 1
INTRODUCTION TO WACO STANDARD SCAFFOLDING

There are three basic types of tubular metal scaffolding available in the United States today; frame scaffolding, tube and coupler, and modular systems scaffolds.

Frame Scaffolding (Waco frames)

The primary steel scaffolding system used in the U.S. It is primarily for rectangular jobs where access is not too restricted. Frame scaffolding is very popular with masons, plasterers, etc.; and is also used extensively as rolling towers for internal work (electricians, heating, air conditioning, painting, etc.). Frame scaffolding is relatively simple and fast to erect, provided the surface is level, and the access is not restricted.

Tube and Clamp (Fastube)

Evolved in the U.S. to accommodate jobs too difficult for frame scaffolding because of obstructions, limited access, and the need to scaffold non-rectangular shapes. In many cases, tube and clamp is used together with frames.

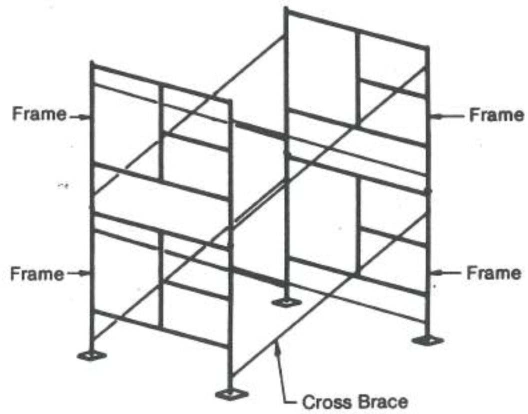
Tube and clamp is simply a steel version of the old access scaffold which historically were made from lumber.

Tube and clamp requires much greater expertise to erect, and takes much longer to erect than frames or system scaffolding. It is most popular in industrial applications such as oil refineries.

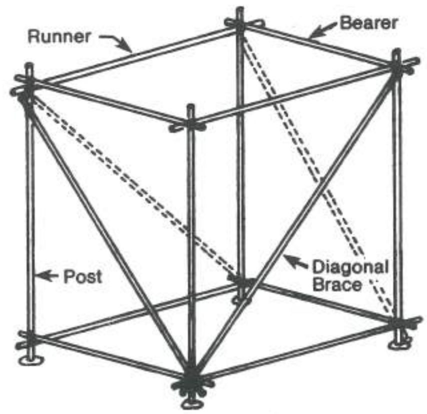
System Scaffolding (Wedgelok®)

System Scaffolding is a recent introduction to the U.S., however it has been used in other countries for many years.

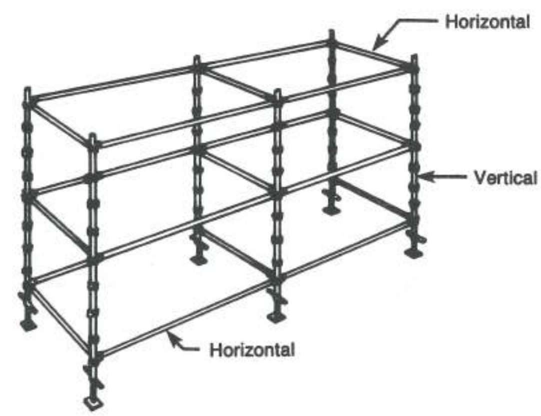
System scaffolding like Wedgelok is used for applications where frames cannot be used or where it is not efficient to use frames (limited access, obstructions, uneven surface, non-rectangular shapes). The advantage that system scaffolding has over tube and clamp is that it does not require the high degree of expertise that tube and clamp does. With system scaffolding, the location of the connections is fixed. As such, once the base is set, the erector does not have to worry about the location of connections (as he would with tube and clamp). Erection time is fast and the equipment is versatile thus giving good utilization.



Frame Scaffolding



Tube and Clamp Scaffold



System Scaffolding most popular in commercial applications such as access to buildings and industrial applications such as power utility boilers and chemical refineries.

SECTION 2
GENERAL REQUIREMENTS FOR SCAFFOLD ERECTION, USE, AND DISMANTLING

Introduction
It should be understood that scaffolding is a precise structure which, if used in all its aspects with intelligence and care, will perform well. Consideration needs to be given to planning and carefully managing the erection, the use, and the dismantling of the scaffold. The importance of proper training can not be over-emphasized. In fact, O.S.H.A. has mandated that the employer must provide training for erectors/dismantlers and users in the hazards related to work on scaffolds. Scaffold users must be trained by a qualified person on the nature of electrical, fall and falling object hazards, the proper procedures for dealing with these hazards (including the use of fall protection and falling object protection systems), the proper use of the scaffold, the proper handling of materials on the scaffold, the maximum intended load, the safe working capacity of the scaffold, and any other pertinent requirements of the O.S.H.A. requirements. Scaffold erectors/dismantlers must be trained by a qualified person on the nature of scaffold hazards, the correct procedures for erecting, dismantling, moving, operating, repairing, inspecting and maintaining a scaffold system, the design criteria, maximum intended load and intended use of the scaffold, and any other pertinent requirements of the O.S.H.A. requirements. Additionally, retraining is required for both erectors/dismantlers and users where changes at a worksite present new hazards, where changes in the types of scaffold, fall protection, falling object protection or other equipment present new hazards, or where inadequacies in an employee's work indicates a lack of relevant proficiency.

Erection
It is important to properly plan the erection of a scaffold prior to starting the erection. The planning should be done by a person qualified to do so. In fact, to meet current O.S.H.A. requirements, tubular welded frame and tube and coupler scaffolds in excess of 125 feet high above their base plates must be designed by a registered professional engineer.

During the planning stage, and just prior to starting erection, a site inspection must be made by the competent person (see section 3). These inspections are primarily to check for hazards such as high tension wires, unguarded openings, hazardous conditions created by other trades, etc. on the site which must be eliminated prior to the erection and use of the scaffold. Care must be taken to ensure compliance with all the applicable safety procedures and regulations required by federal, state, or local statute. Such things as O.S.H.A. warning posters, emergency telephone numbers, etc. are always required. The competent person must also determine if fall protection for the erectors/dismantlers will be feasible.

For a scaffold to be safe, it must be erected straight, level, and plumb. To achieve this, it is necessary to take great care over plumbing, aligning, and levelling the base of any scaffold. Care should be taken to maintain the correct clearance between the structure and the scaffold.

Prior to and during erection of the scaffold, all materials used in the scaffolding should be checked to ensure that they are in good condition. All scaffolding material must be inspected by a competent person before use, to check that it is up to standard. Any substandard equipment should be scrapped or set aside for repair.

Check the following:

1. Are all planks and wooden components free of splits, rot, oil, or any paint which would cover potential defects?
2. Are all welds and bolted connections in good condition?
3. Are all locking devices on frames and braces in good working order?
4. Are all members or parts of all the steel scaffolding components straight and free from bends, kinks, dents, cracks and excessive rust?
5. Is the scaffold erected in accordance with Waco's recommendations and is all the safety equipment installed?
6. Does the scaffold comply with all federal, state, and local regulations?
7. *Most important:* Is the scaffold erected on good foundations and tied to the building at the interval specified by Waco or O.S.H.A.?

The above check list is a guide to be used during erection. Checks should be made to ensure compliance with the specific requirements of federal, state, and local regulations in addition to Waco's recommendations.

Use
The scaffold system must be inspected by the competent person before every work period prior to its use. Only the competent person may authorize the alteration of a completed scaffold. Particular care should be taken when changing the position of planks and ties. Safety devices such as handrails and toe boards must not be removed. When climbing onto the scaffold, the correct means of access should be used; and, when working on the scaffold, care must be taken not to overload (See Section 8 for loads) the platform. If working above other people, suitable precautions must be taken. (See Section 9 for toe boards).

Dismantling Scaffolds

Prior to dismantling a scaffold it is very important that a careful check be made to ensure the scaffold has been erected properly and that no structural alterations have been made. It is particularly important to check that the correct number of ties and braces are in position. For example, a scaffold may stand with only the top tie in position after the intermediate ones have been removed; but when you start dismantling from the top - WATCH OUT! If ties or braces have been removed, they must be replaced before any dismantling takes place.

Dismantled material should never be stored on a scaffold. All components should be lowered to the ground by passing from man to man, a rope or with a hoist - *equipment must never be thrown down,* as it may cause property and equipment damage and human injury.

If any scaffold is partially erected (or partially dismantled) but is still capable of being used to some extent, it must have proper warning notices posted on the scaffold. It is recommended to leave a scaffold in either totally unusable condition (with no planks on it) or in a totally safe and usable condition, even if it is for a very short duration.

Always dismantle from the top of a scaffold downwards.

Always check that all planks are correctly seated and not about to fall as you remove other planks.

Always check equipment and properly mark any unsafe equipment as it is being dismantled and scrap it. It is critically important to continuously check for unsafe equipment at all times.

DO'S AND DON'TS DURING ERECTION, USE, AND DISMANTLING

1. *Always* tie scaffold into buildings or other solid structures whenever the height of the scaffold exceeds four times the minimum base dimension for Federal O.S.H.A. regulations (or three times the minimum base dimension per California O.S.H.A. regulations).

2. *Always* access the scaffold the correct way – never climb cross braces. See Section 15.

3. *Never* erect or dismantle scaffolds above people, access ways, or roads while in use.

4. *Never* overload the work platform with materials.

5. *Never* work or allow others to work, if unsafe conditions exist.

6. *Never* remove planks or supporting members from a working level.

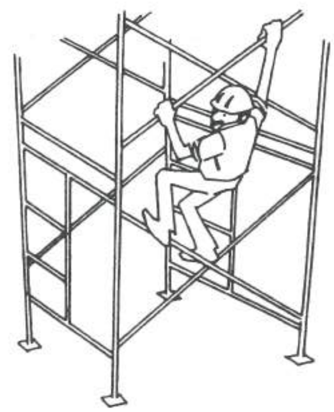
7. *Never* remove handrails or midrails without making the scaffold safe.

8. *Never* use equipment for purposes other than those recommended by Waco. Contact Waco's Engineering Department for further information.

9. *Never* use the scaffold as an anchorage point for fall protection equipment.

TIE SCAFFOLD TO BUILDING.

DON'T CLIMB ON BRACES.



DON'T OVERLOAD SCAFFOLDING.

SECTION 3

FEDERAL O.S.H.A. REGULATIONS

IMPORTANT:

O.S.H.A. 1926.451 Scaffolds shall be erected, moved, dismantled or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or alteration. A competent person means one who as a result of specific training and/or experience is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them, and who otherwise has the capacity and authority to carry out the responsibilities assigned to the competent person in this Subpart (Subpart L). You must familiarize yourself with the latest O.S.H.A. standards before attempting to assemble any scaffolding.

Some states which have the personnel and expertise, have developed their own standards or revised the ones they had before Federal O.S.H.A. became law. They may be more stringent. So, if you are doing business in a State which has adopted its own standard, be sure to obtain a copy of those standards.

State standards are required to be "at least as effective as" federal standards. However, most states have "mirror standards"-they adopted by statute in reference to the standards published by Federal O.S.H.A.

CAUTION
CHECK WITH YOUR LOCAL O.S.H.A. OFFICE FOR THE LATEST UPDATE.

PART B. GENERAL REQUIREMENTS FOR SCAFFOLDS

SECTION 4
FOUNDATIONS/SILLS

The strength and stability of a scaffold is as dependent on the foundation it bears on as the scaffold itself. Many accidents involving scaffold collapses are due to poor foundations.

The competent person must verify that the existing foundation will safely carry the imposed load. Base plates must be placed under all legs. They must be securely fixed if there is potential for lateral movement.

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.

Considering that the allowable bearing loads on various soils could be less than 1,000 pounds per square foot, care should be exercised in determining the capacity of the soil for every job. 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 pounds per square foot could become very plastic after a rainfall and drop to less than 2,000 pounds per square foot.

When soil conditions are poor or frozen, it may be necessary to excavate the poor soil and replace it with good compacted material. If this is not practical, then the leg load must be distributed by means of a larger sill area which is large enough to carry the load. A person qualified to determine this should be consulted and his advice taken. (See Fig. 4.1)

It is recommended to use a mudsill which is continuous under both legs of the scaffold. The sill should be such that it extends at least 9" past the center line of the leg and be of 2" X 10" lumber. When the sill is located as shown, it provides the additional function of acting as a foot tie (See Fig. 4.2 a & b).

Bricks, loose fill, or other means of increasing the height on uneven ground are not acceptable. (See Fig. 15.10). Where the scaffold is to be erected on soil which is fill or an imprint can easily be made in it with the heel of a shoe, or the scaffold is more than ten frames high, or the scaffold is heavily loaded, a qualified person should be consulted.

One of the most common faults that arise on site is excavating under, or in the vicinity of the base of

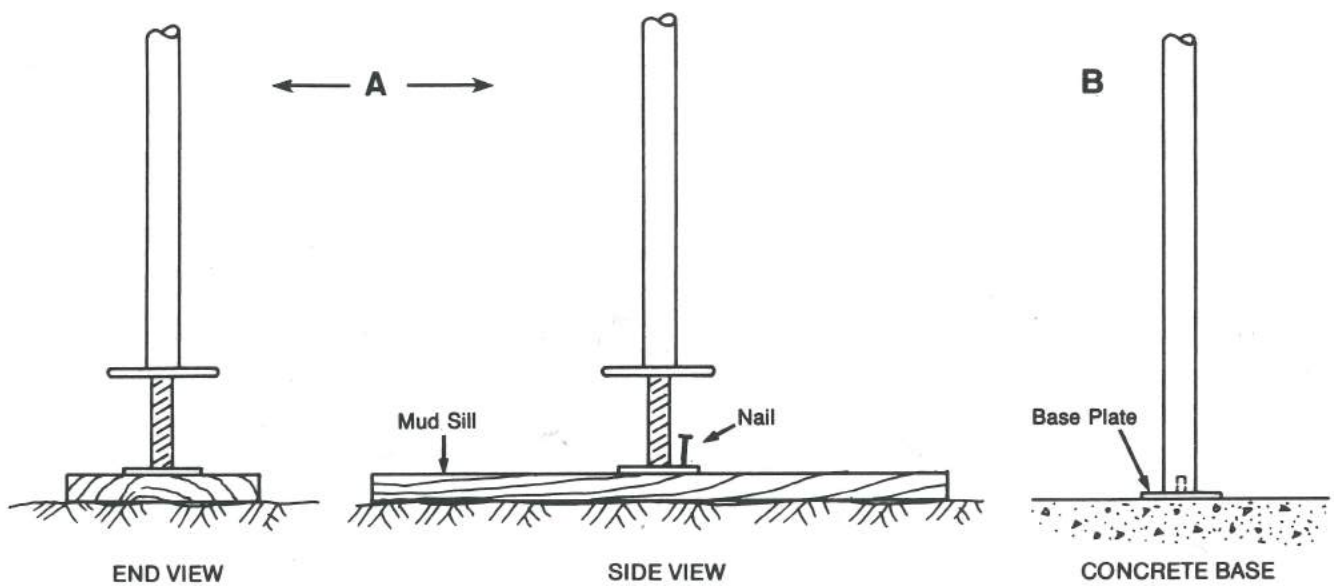
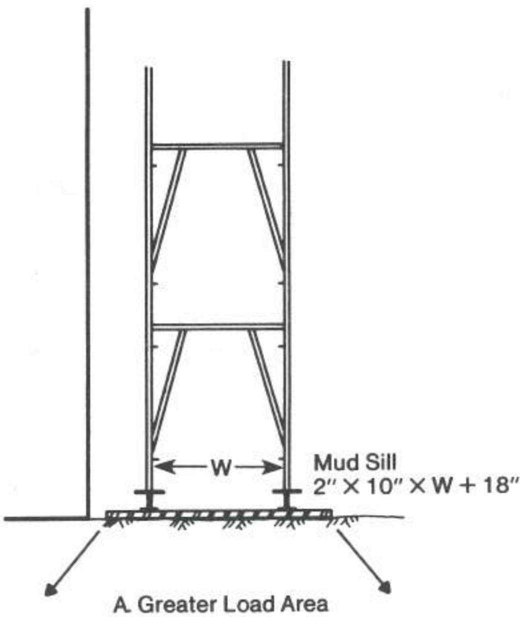


Fig. 4.1 A. Two views of compacted ground or similar soil conditions. Leg located central of mud sill.
B. On concrete a base plate is necessary but the mud sill may be omitted.



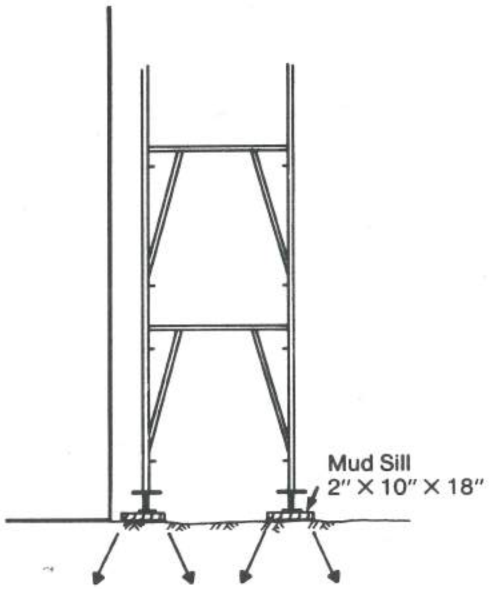


Fig. 4.2

the scaffold. If excavating has got to be done near the base of the scaffold, the scaffold should be adapted or strengthened to counteract the risk of settling. Foundations must always be firm and consolidated. Allowances should also be made to protect the scaffold from passing traffic which could impact and damage the scaffold.

Adjusting Screws

When a scaffold is being erected on uneven grade, adjusting screws should be used in all legs. The only exception to this is when a tube and coupler scaffold is being used. In this case, all legs must be attached to base plates and firmly seated on the sills. This will ensure that the scaffold loads are evenly distributed between legs.

SECTION 5
BRACING

The position and number of braces used on a scaffold not only restricts the amount of side movement, but also determines the strength of the scaffold.

It is important to note that in the same way that a building needs its columns braced in both directions at each floor by the shear walls and the elevator shafts, so does a scaffold. A scaffold must be rigid in both directions. Bracing at right angles to the building is achieved by the ties to the building and the inherent rigidity of the frame. Special care should be taken with tube and coupler or system scaffolding which need transverse bracing (Fig. 5.3) as well as ties. For these reasons it is most important that braces are placed according to Waco's recommendations. All vertical members must be connected horizontally at regular intervals by horizontal bracing, cross bracing, or other methods.

The normal interval is every lock spacing with a frame scaffold and every 6′ – 6″ for tube and coupler or system scaffolding. The bracing should transfer any horizontal load to the ground or a structure capable of withstanding the forces, such as the building at a tie position.

A typical example of bracing for Wedgelok and tube and clamp is shown in Fig. 5.4. For frame scaffold bracing see Fig. 5.5. For more details on Wedgelok and Tube and Clamp, see sections 7 and 8.

CAUTION
CROSS BRACES SHOULD NOT BE USED AS A WAY TO CLIMB THE SCAFFOLD. ALL BRACES MUST BE CHECKED FOR PROPER ENGAGEMENT INTO THE LOCKS.

Bracing Requirements for Scaffold Legs:

If any vertical member in any structure is designed to carry a load and to be a certain height (Fig. 5.1 A) and then its height is doubled, it will support less than one half the Design Load. (Fig. 5.1 B) However, if the middle of this member is restrained from horizontal movement in both directions (Fig. 5.1 C) it will support the Design Load at the increased height. This applies for each and every multiple of height H of a column of a building or scaffold.

Scaffolds are typically designed with this height H being 6 feet 6 inches. This means adequate horizontal restraint needs to be given every 6 ft. 6 in. This is achieved by a combination of braces and horizontal members along the face of, and perpendicular to, the scaffold. See Fig. 5.2. which shows how horizontal support is achieved every 6 ft. 6 in. along the face of the scaffold.

In the plane perpendicular to the face of the scaffold the horizontal support is provided by a combination of ties, horizontal members and transverse braces. See Fig. 5.3.

Because a frame has its own inherent strength in the plane perpendicular to the cross-braces, transverse braces are not required. Tie spacing varies with the type of frame and leg loads being applied. (See Section 8 Load Capacity.)

In the plane of the face of the scaffold cross braces or face bracing must be used. It is important to note that the horizontal support is being transferred from the ground up to the levels above, so sufficient braces must be provided from ground level upwards. For tube and clamp, no more than three unbraced bays between each braced bay, see Fig. 5.4, are required. For Frames see Fig. 5.5 for typical arrangements.

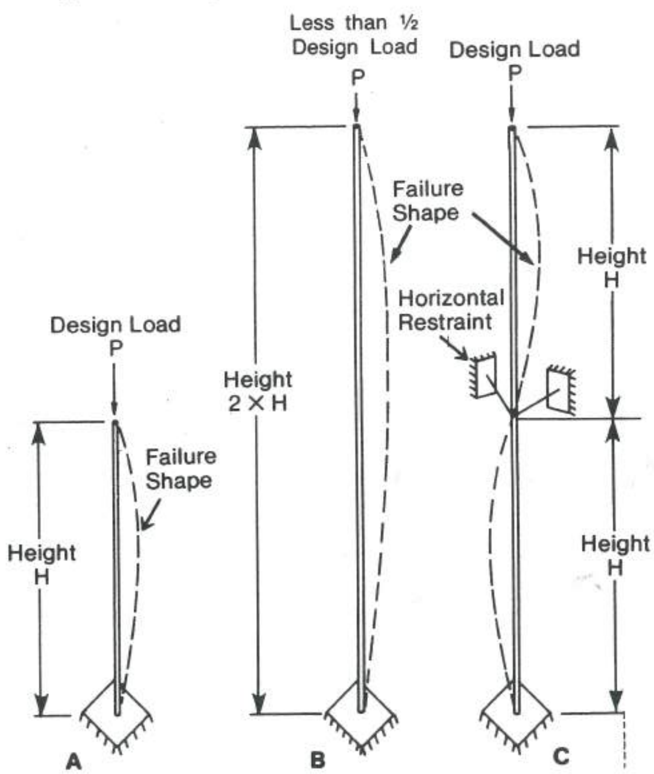


Fig. 5.1

It should be noted that Plan Bracing or positively fixed planks are required at each level of ties to transfer the horizontal restraint between ties. See Fig. 5.4 Plan Bracing.

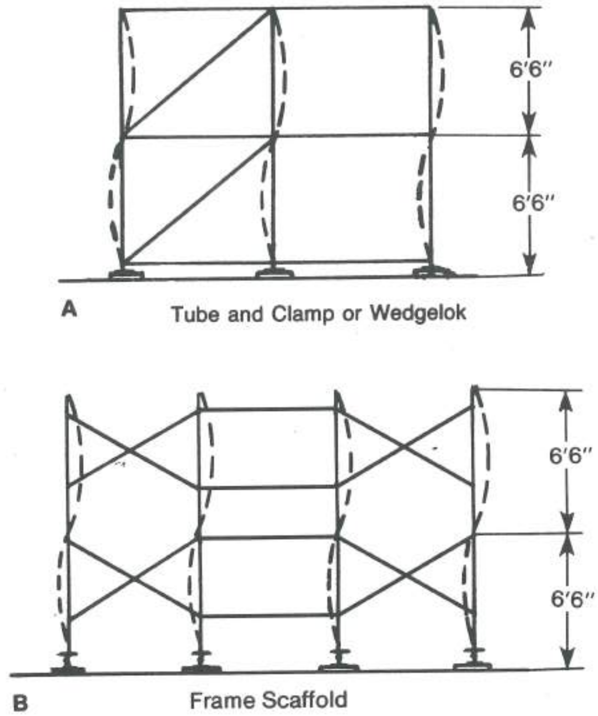


Fig. 5.2

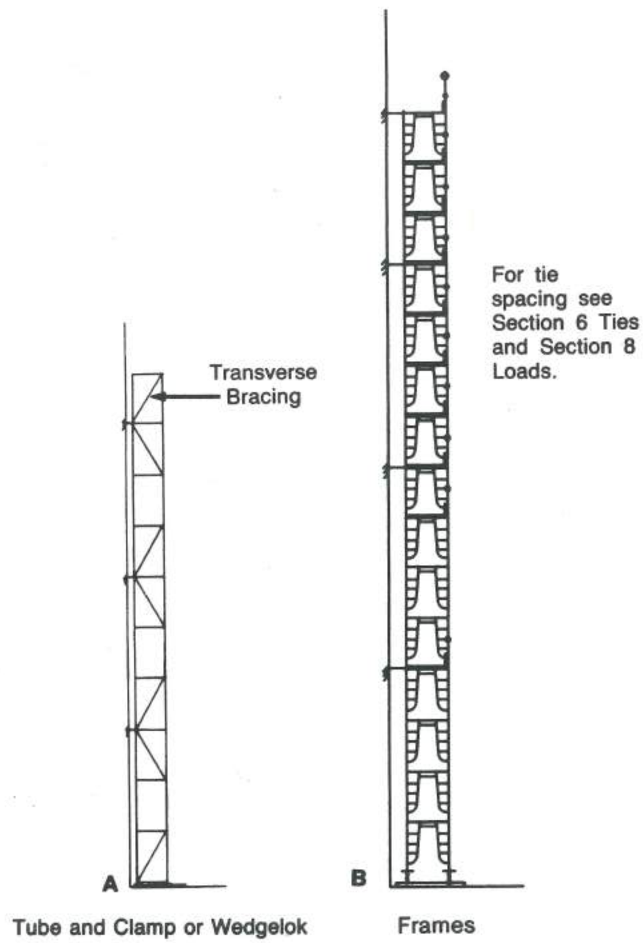


Fig. 5.3

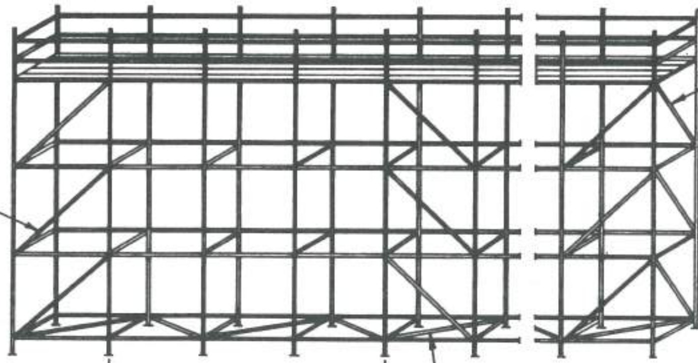
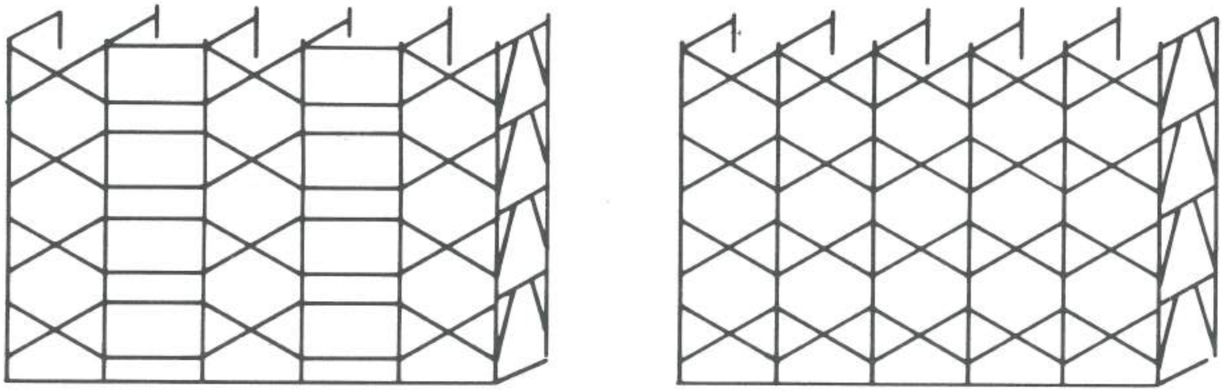


Fig. 5.4 Types of Bracing (For Tube & Clamp and Wedgelok)



Customary West Coast Frame Scaffold Bracing Both Faces

Customary East Coast Frame Scaffold Bracing Both Faces

Fig. 5.5 Frame Scaffold Bracing. Bracing patterns vary with the different types of scaffold being used. The patterns shown above are more common in the areas indicated.

SECTION 6
TIES

It is essential that every scaffold be adequately tied to the building structure throughout its entire length and height. If not, collapse of the scaffold will occur. Ties have a dual purpose, they control the overall stability of the scaffold from forces such as wind loads and most importantly, brace the legs. See 5.1 and 5.3.

Fig. 6.1 shows the salient features regarding form, safety, and good practice for a typical independently tied scaffold. As the name implies this type of scaffold is independent of the adjacent structure in that it supports the vertical loads due to its own weight plus any imposed loading. The insertion of the word 'tied' emphasises the very important condition that independent scaffolds are not independent where lateral stability is concerned and should be effectively 'tied' to the adjacent structure if it is sound (or provided with alternative lateral support) at regular specified intervals.

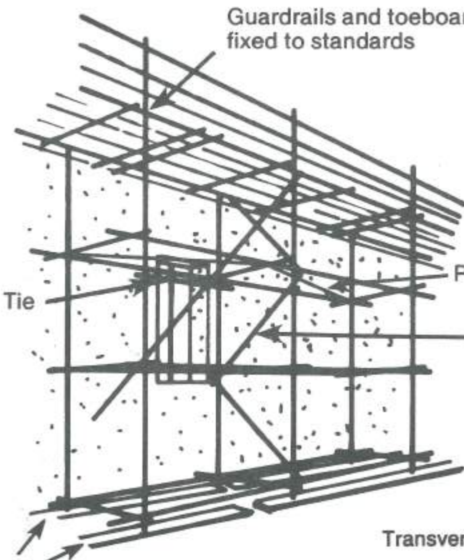


Fig. 6.1

The word 'tie' is itself a misnomer in that it conveys the impression of a tensile member, whereas in practice it is essential that all 'ties' should provide compressive and tensile resistance to any lateral forces acting on the scaffold, such as push-pull ties. Collapses have occurred owing to neglect of this requirement whereby the scaffold swayed towards the adjacent building hence allowing sufficient eccentricity for a general collapse to occur.

RULES

General rules for ties are:

1. All ties should be fixed with load bearing couplers.
2. The entire scaffold shall be tied to and securely braced against the building at intervals not to exceed 30 feet horizontally and every 26 feet vertically when the scaffold is greater than 3 feet wide, and 20 feet vertically when the scaffold is 3 feet or narrower. These are the maximum allowable spacings, and in many circumstances, ties are required more frequently.
3. Ties should be as close as possible to the junction of the standard and ledger.

Common methods of tying are:

THROUGH TIES (POSITIVE TYPE)

A tube is taken through any convenient opening, such as a window, and coupled to vertical or horizontal tubes, butting hard against the inside and outside faces of the wall opening. These tubes should span across the short distance of the opening for greatest strength. It may be necessary at times to remove bricks to allow a tie tube to go through the wall. This is a positive tie. (See Fig. 6.2)

REVEAL TIES (NOT POSITIVE)

A tube is wedged into an opening in the wall by means of a 'Reveal Pin'. This is an expanding type pin. A second tube is then fixed between this tube and the scaffold to form the tie. The reveal pin normally consists of a piece of tube with a base plate at one end and a screw jack at the other.

Dry timber blocking should then be placed at each end to protect the inner surface of the opening to increase friction.

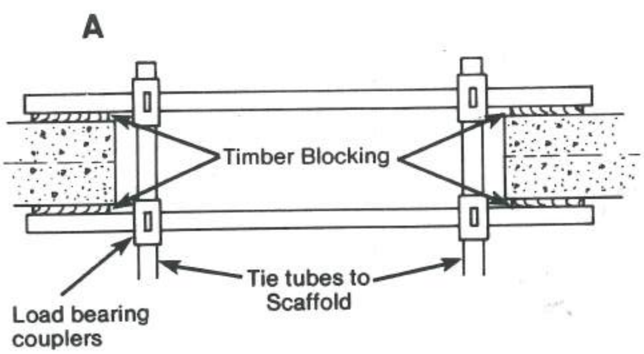
Reveal ties and ties formed by connecting to an adjustable post shore wedged between floors are not reliable owing to shrinkage of the timber blocking, and should not be used unless they are checked at frequent intervals. If used in conjunction with a hard rubber pad, such as Neoprene which is not affected by temperature and humidity changes, then this type of tie could be more reliable. (See Fig. 6.3) Movement of this structure during construction can also affect these ties.

CAUTION

REVEAL TIES MUST BE FREQUENTLY CHECKED AS VIBRATION TENDS TO SLACKEN THE REVEAL PIN LEAVING IT INEFFECTIVE.

BOX TIES (POSITIVE TIES)

This tie can be used if there are more columns close to the scaffold. Tie tubes run both sides of the column, with cross tubes tied back and front to both tie tubes. It may be necessary to protect the column from damage by inserting blocking or hardwood wedges. (Fig. 6.4)



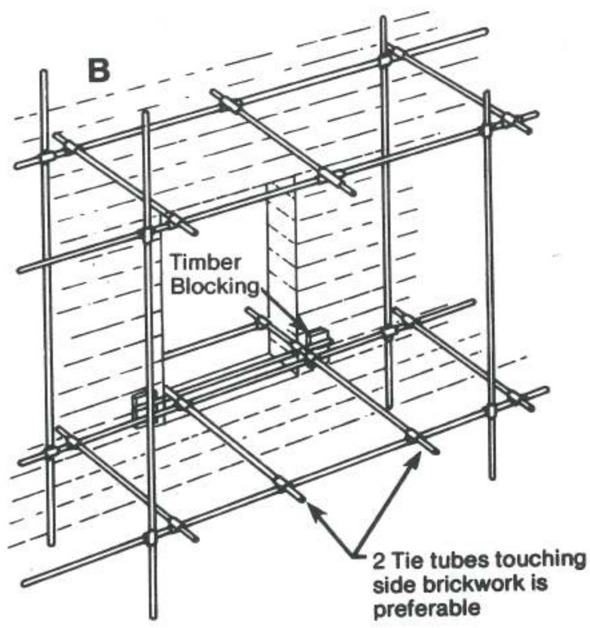


Fig. 6.2 A. Plan view of through tie. **B.** Through tie.

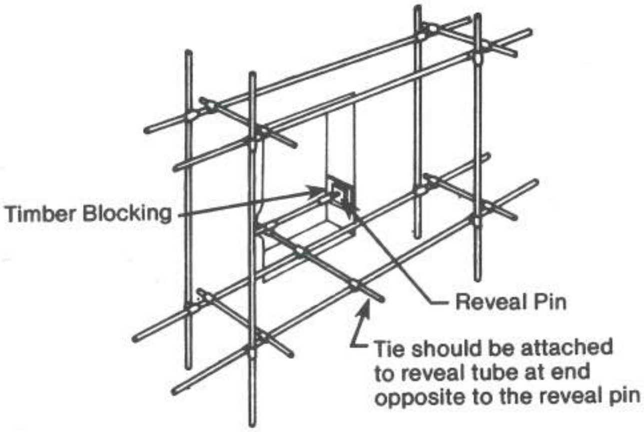


Fig. 6.3 Reveal tie. (Note: The tube in the reveal can be in the vertical or horizontal position.)

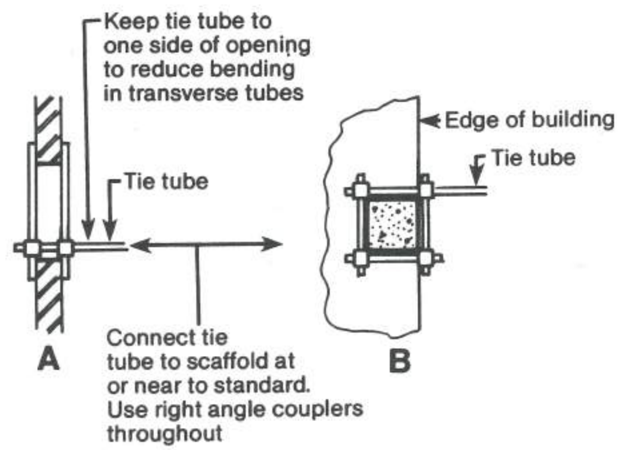


Fig. 6.4 Box tie. A. Vertical or horizontal section through wall. **B.** Horizontal or vertical section through structural member.

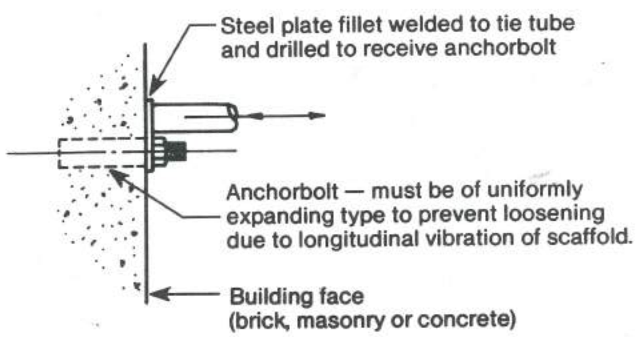


Fig. 6.5 Anchor bolt tie. Vertical or horizontal section through wall where no openings or members are available for tying to.

ANCHOR BOLT TIE (POSITIVE TYPE)

There are so many types of anchors available. They do however, very in pull-out strength and they leave a hole behind which has to be repaired. A pull out force of at least 800 lbs, 1200 lbs, and 1600 lbs, is necessary for light, medium and heavy duty scaffolds respectively. (Fig. 6.5)

Fig. 6.6 Tie through opening

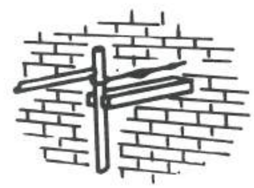


Fig. 6.7 Tie to Masonry tie

NO. 9 WIRE TIE

The wire tie is a common tie which if installed correctly is effective. But extreme care should be taken when using this type of tie. Experienced scaffolders only should use this type of tie. (Fig. 6.6 & Fig. 6.7)

CAUTION

1. USE ONLY NO. 9 DRAWN WIRE.
2. ALWAYS TWIST TIGHTEN UNTIL THE 2"X4" IS FIRMLY HELD IN PLACE.
3. SECURE 2"X4" SO THAT IT CAN NOT FALL OUT.
4. DO NOT OVER TWIST AND FRACTURE WIRE.
5. DO NOT LEAVE A LARGE LOOP IN THE MIDDLE OF THE TIE.

TUBE TO BEAM CLAMP TIE

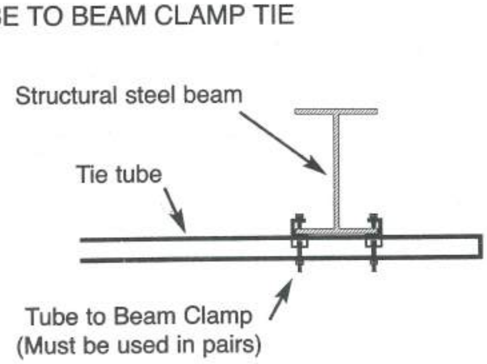


Figure 6.8 Tube to Beam Clamp.
This section can be vertical or horizontal.

SECTION 7
PLANKING

Wood scaffold planks should be nominal 2″ × 10″ (actual 1-½″ × 9-¼″) and should be "Scaffold Plank Grade". Planks should bear the stamp of a grading agency approved by the American Lumber Standards Committee.

The maximum span for wood planks should not exceed 8′. A span of 8′ is rated for 25 pounds per square foot maximum. A span of 6′ is rated for 50 pounds per square foot maximum.

Planking should extend a minimum of 6″ over the center of each support, (unless cleated to prevent the plank from sliding), and a MAXIMUM OF 12″. Gaps between adjacent planks or toeboards should not exceed 1″. (See Fig. 7.1)

To provide continuous planking around corners, planks must be placed so as to avoid tipping. To avoid overloading the side planks of a platform, overlap planks at right angles to each other and extend across the whole platform so that the load at the side is distributed over all other planks.

Where necessary to place planks at an angle other than horizontal, as for ramps or elevation changes of the platform for work on variable-height ceilings, any slope greater than 1:10 should have cleats nailed 12″ apart to the tops of the planks. Always plank out the full width of the scaffold.

CAUTION
DEBRIS AND RUBBLE SHOULD NOT BE ALLOWED TO ACCUMULATE ON PLANKING AND SHOULD BE REMOVED AS QUICKLY AS POSSIBLE. PLATFORMS SHOULD BE CLEARED OF ICE AND SNOW BEFORE BEING USED FOR WORK.

Checking of Scaffold Boards (See Fig. 7.2)

A board should not be used if:

1. Either end is split sufficient to cause a weakness.
2. It is damaged by fracture or saw cut, is splintered, has been nailed, or concrete or plaster is sticking to it.
3. It has had oil, corrosive liquid or acid spilt on it.
4. It has any part painted (which may cover up a weakness)
5. It is excessively warped, or if any part is decayed.

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

Return a damaged or defective scaffold board to supplier and inform them of its state. Unsafe boards should be clearly marked or made unusable by cutting in half. Never use full length scaffold boards for mud sills, to avoid damaging.

Beware of used boards that are extremely light in weight as compared with similar boards of the same length.

For all prefabricated scaffold planks, follow the manufacturer's recommendations for allowable loads and maximum spans.

CAUTION
ON ALL HIGH SCAFFOLDS, EXTRA CARE SHOULD BE TAKEN TO PLAN FOR THE EFFECTS OF WIND. ALL PLANKS SHOULD BE TIED DOWN WITH #9 WIRE OR PLANK RESTRAINING CLIP AND TOOLS SHOULD NOT BE ALLOWED TO LIE AROUND LOOSE.

Steel/Aluminum Plank

Purpose made metal planks should be used in accordance with the manufacturer's recommendations. They should never be used when in bent, cracked, buckled or corroded condition. Always hook both ends properly over the bearer of the scaffold.

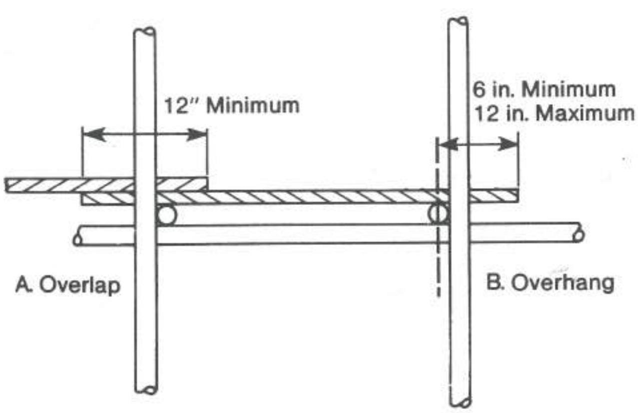


Fig. 7.1 A. Boards must overlap by 12″ or be secured from movement. **B.** The overhang of board on bearer is a minimum of 6″ to a maximum of 12″.

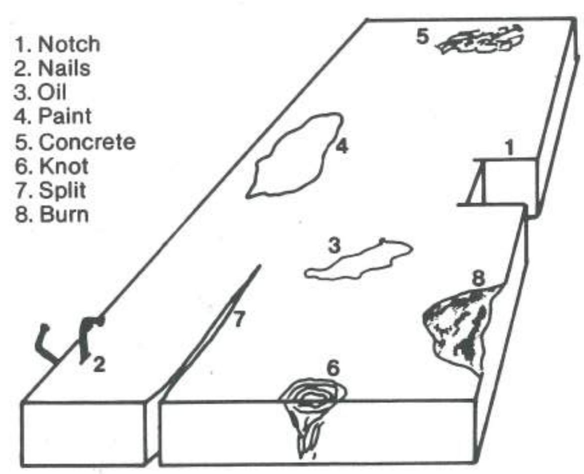


Fig. 7.2

SECTION 8
LOADS

Load Capacity

The maximum load capacity of a scaffold is determined by computing the maximum load being applied to the various components of the scaffold structure and ensuring these are less than Waco's recommendations.

O.S.H.A. requires that a scaffold be designed with a 4 to 1 safety factor. This safety factor is included in the maximum load capacities recommended by Waco. In order to compute the load being applied, three things must be taken into consideration.

1. The intended use of the scaffold. O.S.H.A. defines the design live load to be applied to each working level depending on use.
   - A. Light Duty - 25 pounds per square foot of work platform. This is for trades such as painting, window cleaning, etc.
   - B. Medium Duty - 50 pounds per square foot of work platform for trades such as plastering, etc.
   - C. Heavy Duty - 75 pounds per square foot of work platform for trades such as masons, stone setters, etc., where heavy material loads will be put on the work platform.

These loads must then be apportioned to the structure depending on the area of the platform. Note that the design loads defined by O.S.H.A. are neither minimums nor maximums. Other design loads are often required. Check with a qualified scaffold designer if you have any questions.

2. The number of work platforms which will be used simultaneously above each other. The sum of the loads per working platform must then be added and applied to the structure.

3. The height of the scaffold. The self-weight of all components of the scaffold must be added.

Total Load Applied

The total load applied is the sum of the live loads plus the self-weight of the scaffold.

Other Loads

Extreme care should be taken of other loads such as a build up of snow, ice, and wind pressure on enclosures, or protection equipment attached to the scaffold.

In situations where the scaffold is to be loaded in an unusual way, either due to an applied load or change in construction of the scaffold, a person qualified to check the scaffold should be consulted.

> **CAUTION**
> TOTAL APPLIED LOAD MUST NOT EXCEED WACO'S RECOMMENDATIONS. (See Pg. 16, Fig. 8.5.)

Material loads should be evenly distributed on platforms (Fig. 8.4) and not concentrated in one small area (Fig. 8.3). If it is necessary to lump the material in one spot, it should be directed over the verticals. (See Fig. 8.1.)

> **CAUTION**
> CARE MUST BE TAKEN TO PROTECT PEOPLE BELOW FROM FALLING MATERIAL BY USING THE PRECAUTIONS SHOWN IN FIG. 8.2, OR BY BARRICADING THE AREA BELOW SO THAT NO ACCESS CAN BE OBTAINED UNDER THE SCAFFOLD.

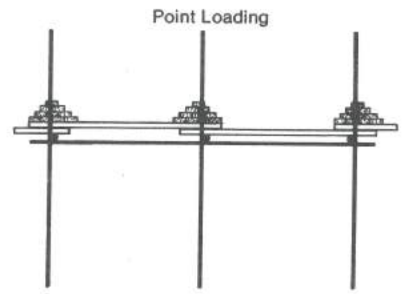


Fig. 8.1 Where point loading is necessary it should be directed over verticals or frames.

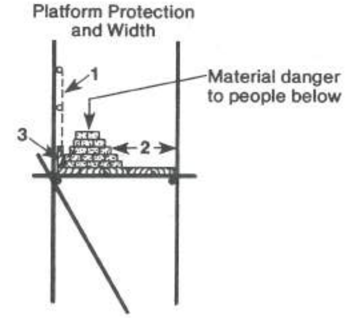


Fig. 8.2 **1.** ½" 18 gauge mesh. **2.** Access wide enough? OSHA requires min. of 18 in. **3.** Toe boards.

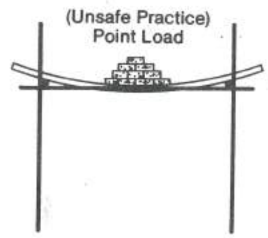


Fig. 8.3

Fig. 8.4

Calculating Loads

It is very important to note that the Load Capacity of a scaffold system varies with its design and application. Waco's recommended loads must be strictly applied and adhered to in all circumstances.

This section requires some engineering calculations and interpretation of the load tables. It is beyond the scope of this guide to explain all aspects of leg load calculations. Never take chances with scaffolding. If you are uncertain as to how to determine the scaffold loading for your installation or how a particular accessory or application will affect your scaffold, consult Waco's engineering department.

Allowable Loads

Federal O.S.H.A. requires a four to one safety factor to be built into all scaffold structures. Therefore, the loads published by Waco include this safety factor for each type of scaffold.

The leg load tables, Fig. 8.5, are the maximum allowable leg loads for one through four tiers of scaffold. Here the term tier is defined as the height of the frame under consideration. For example, one tier of a 6 ft. 6 in. frame is 6 ft. 6 in. high, four tiers of 6 ft. 6 in. frame are 26 ft. high.

For scaffolds exceeding four tiers in height, the following factors must be considered.

1. Tie Spacing - the distance between the ties is dependent upon the number of tiers of scaffold corresponding to the allowable load selected from the allowable load table, Fig. 8.5. The spacing of the ties must not exceed this number of tiers for the required allowable load selected. For example, if the required allowable load corresponds to four tiers of scaffold the ties should be placed every four tiers.

FRAME NUMBER	NUMBER OF TIERS	ALLOWABLE LOAD/LEG *
0153-00 0154-02 0154-62	1 TIER	4000 lbs.
	2 TIERS	3300 lbs.
	3 TIERS	3200 lbs.
	4 TIERS	2850 lbs.
0155-00 0155-22	1 TIER	3850 lbs.
	2 TIERS	3200 lbs.
	3 TIERS	3060 lbs.
	4 TIERS	2700 lbs.
0156-05 0156-20	1 TIER	3000 lbs.
	2 TIERS	2640 lbs.
	3 TIERS	2260 lbs.
	4 TIERS	2020 lbs.

FRAME NUMBER	NUMBER OF TIERS	ALLOWABLE LOAD/LEG *
1153-00 1154-00 1155-00 1254-00 1255-00	1 TIER	4575 lbs.
	2 TIERS	3000 lbs.
	3 TIERS	3000 lbs.
	4 TIERS	3000 lbs.
1256-00	1 TIER	3000 lbs.
	2 TIERS	2000 lbs.
	3 TIERS	1775 lbs.
	4 TIERS	1750 lbs.
1568-00	1 TIER	3300 lbs.
	2 TIERS	2200 lbs.
	3 TIERS	2100 lbs.
	4 TIERS	2000 lbs.

FRAME NUMBER	NUMBER OF TIERS	ALLOWABLE LOAD/LEG *
0053-80 0054-82	1 TIER	4000 lbs.
	2 TIERS	3300 lbs.
	3 TIERS	3200 lbs.
	4 TIERS	2850 lbs.
0055-22 0055-80 0054-68	1 TIER	3650 lbs.
	2 TIERS	3000 lbs.
	3 TIERS	2900 lbs.
	4 TIERS	2560 lbs.

FRAME NUMBER	NUMBER OF TIERS	ALLOWABLE LOAD/LEG *
0156-06 0156-07	1 TIER	3270 lbs.
	2 TIERS	2900 lbs.
	3 TIERS	2520 lbs.
	4 TIERS	2260 lbs.
0123-00 0125-00	1 TIER	3950 lbs.
	2 TIERS	3200 lbs.
	3 TIERS	2760 lbs.
	4 TIERS	2575 lbs.
0126-00 0156-02	1 TIER	2325 lbs.
	2 TIERS	2140 lbs.
	3 TIERS	1950 lbs.
	4 TIERS	1700 lbs.

FRAME NUMBER	NUMBER OF TIERS	ALLOWABLE LOAD/LEG *
1334-00	1 TIER	4575 lbs.
	2 TIERS	3000 lbs.
	3 TIERS	2760 lbs.
	4 TIERS	2575 lbs.
1350-00	1 TIER	4575 lbs.
	2 TIERS	3400 lbs.
	3 TIERS	3200 lbs.
	4 TIERS	3000 lbs.
1368-00	1 TIER	3000 lbs.
	2 TIERS	2250 lbs.
	3 TIERS	1925 lbs.
	4 TIERS	1750 lbs.
0056-82 0056-22	1 TIER	2200 lbs.
	2 TIERS	2000 lbs.
	3 TIERS	1850 lbs.
	4 TIERS	1600 lbs.

FRAME NUMBER	NUMBER OF TIERS	ALLOWABLE LOAD/LEG *
0066-87	1 TIER	3100 lbs.
	2 TIERS	2750 lbs.
	3 TIERS	2400 lbs.
	4 TIERS	2150 lbs.

Fig. 8.5 All values based on 12" maximum screw extension at the base of the scaffold. Tests have been performed in accordance with SSFI test procedures.

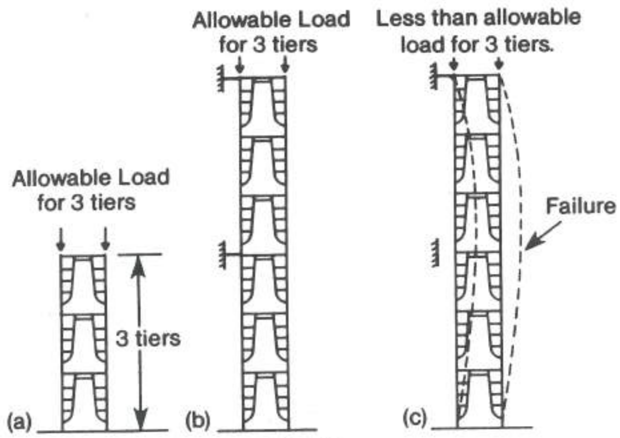


Fig. 8.6

The above figure, 8.6, a, b, c illustrates that the tie spacing for the full height of the scaffold must be equal to the number of tiers given in the table, Fig. 8.5, for the selected load. If the load selected corresponds to the load for 3 tiers, ties must be at every 3 tiers.

2. Loading - the actual load (Dead load plus Live load) for the scaffold structure above the first tie from the ground must be calculated to ensure that it does not exceed the allowable leg load selected from Fig. 8.5 as above.

* See section 6 for specific tie details.

Calculating Leg Loads

When calculating leg load, there are critical factors to be analyzed. These factors are:

1. Dead Load - the weight of the scaffold structure itself including, frames, braces, planking, and any other accessories or equipment that make up the scaffold. Only frames and braces above the first tie need be calculated because loads shown in Fig. 8.5 includes the weight of frames and braces below the first tie.

2. Live Load - the working load for the scaffold structure. The weight of the men and their materials that is supported by the scaffold, applied to all working levels.

The total leg load is the sum of the dead load plus the live load. This sum must be calculated to ensure that it is less than the allowable leg load for the scaffold system.

Example

A scaffold is erected from 0156-06 walk-thru frames using seven ft. cross braces. The scaffold will be 15 frames high with two light duty work levels and eight planked levels.

The allowable leg load table, Fig. 8.5, shows that the 0156-06 frame four tiers high has a capacity of 2260 pounds with a maximum screw jack extension of 12 inches. This means that 2260 pounds pe leg can be applied to the scaffold, four tiers above the ground. In order to maintain the required load capacity of 2260 pounds above the initial four tiers, we will require less ties every four tiers.

Leg Load Calculations

1. DEAD LOAD

A. Frames (15-4) levels X 56.5#/level)/2 legs per level = 310.75#

B. Braces (15-4) levels X 2 16.7#/2 per level = 183.70#

C. Planks * 5/2 ft. X 7 ft. X 8 levels X 5 p.s.f. =700.00#

D. Guard Rail Post (top level only) = 9.7#

E. Guard Rails (18 req'd for intermediate and top levels) = 18 X 7.2# = 129.60#

F. Toeboards **7 ft. long X 1/2#/ft/ X 8 levels = 28.00#

G. Other Equipment, hoists, etc.***Total Dead Load = 1361.75#

2. LIVE LOAD - 2 levels X 5/2 ft. X 7 ft. X 25 p.s.f. = 875.00#

Total Leg Load = 1361.75# = 875.0# = 2236.75#

2236.75# leg load is less than the 2260# allowable leg load so the scaffold is adequate.

*Assumed weight of planks is 5 p.s.f.

Assumes 1" X 6" timber is used

***Not taken into account in this example.

Notes:

1. Weights divided by two to obtain load capacity for one leg of the frame.

CAUTION

THIS EXAMPLE CANNOT BE TAKEN AS TYPICAL. IT IS MEANT TO DEMONSTRATE THE RELATIONSHIP BETWEEN TIE SPACING AND THE PUBLISHED ALLOWABLE LEG LOAD TABLE, FIG. 8.5.

A different set of calculations is required if:

- side brackets are used.
- the scaffold is more than one frame wide.
- other equipment is attached to the scaffold such as putlogs.
- the scaffold is guyed.
- the scaffold is enclosed.
- a material hoist is employed.
- the leg with the ties is the maximum loaded leg.
- any of many other more complex and often used conditions exist.

For allowable loads for any scaffold, contact the engineering department or the scaffold manufacturer if other than Waco's equipment is being used. (If you would like to learn more about Load Capacity, contact Waco's Engineering Department to find out about training programs offered by Waco).

SECTION 9
GUARDRAILS AND TOEBOARDS

Guardrails and midrails are required on all scaffolds when the platform height exceeds 10 ft. above floor level (7"-6" per California O.S.H.A.).

Guardrail height should be installed between 38 inches and 45 inches above platform surface. (California O.S.H.A. requires no less than 42 inches nor more than 45 inches).

Midrails must be placed midway between the platform and handrail.

Guardrails and midrails are not required on building sides if platform is less than 14 inches from the building.

Guardrails must be able to withstand without failure a force of 200 lbs. applied in any downward or horizontal direction at any point along the guardrail. Midrails must be able to withstand without failure a force of 150 lbs. applied in any downward or horizontal direction at any point along the midrail.

f) Cross braces may be allowed for use as a guardrail or a midrail under certain conditions. Check with current federal, state, local and provincial regulations.

Toe boards

Toeboards must be installed on all open sides and ends of scaffold where people are working underneath the scaffold or there is an accessway under the scaffold. They must be at least three and on-half inches high from the top edge of the toeboard to the level of the walking/working surface. Toeboards must be able to withstand without failure a force of 50 lbs. applied in any downward or horizontal direction at any point along the toeboards. In some circumstances, it is a requirement that mesh be installed between the top rail and the toeboard as a further precaution against objects being knocked off the scaffold.

CAUTION
A CAREFUL CHECK SHOULD BE MADE OF ALL LOCAL REGULATIONS TO ENSURE COMPLIANCE, AS GUARD RAIL REGULATION VARY CONSIDERABLY.
NOTE:
SPECIFIC LOAD AND HEIGHT REQUIREMENTS FOR GUARDRAIL & TOEBOARDS MUST BE MET PRIOR TO USE. CHECK WITH YOUR SCAFFOLD SUPPLIER IF YOU HAVE ANY QUESTIONS.

SECTION 10
ROLLING SCAFFOLDS

CAUTION
CONSULT YOUR FEDERAL AND STATE REGULATIONS FOR PROPER DESIGN AND USE OF ROLLING SCAFFOLDS.

Rolling towers are popular with most trades — painters, electricians, heating and ventilating men and maintenance people. Because these trades and specialists must move around in an area, the rolling tower is a good solution. Rolling towers can be made up from standard WACO® End Frames fitted with horizontal braces (see below) and casters. All frames of rolling towers and casters must be fitted with WACO® Toggle Pins. These pins ensure that the tower sections are held together. Fig. 15.16.

Stabilizer Legs
For Rolling and Stationery Towers

When the height to minimum base ratio of the scaffold exceeds 4 to 1 (3 to 1 California and Ohio O.S.H.A.), stabilizers are required.

Stabilizers may be used with castors or adjustable screws with base plates.

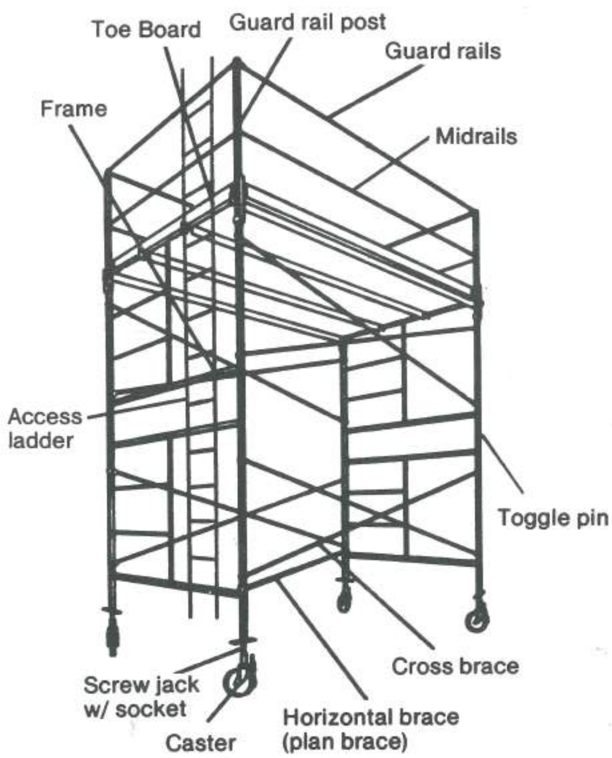


Fig. 10.1

• Cross bracing must always be used with the stabilizer legs.
• Stabilizer legs rotate 90 degrees to facilitate use for moving through narrow areas.

The new stabilizer legs are designed to be used primarily with narrow frames but may also be assembled with the standard 5′ wide scaffold frame. (Fig. 10.5)

These legs will adapt to any standard end frame without additional accessories, but should be used with either casters (5″ or 8″) or adjustable base jacks.

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.

1. Check to see that the platform height does not exceed four (4) times (Federal O.S.H.A.) (3 times California and Ohio O.S.H.A.) 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″. (Fig. 10.3)
3. Check to make sure the caster brakes are in good working condition and are properly applied when the tower is not being moved. (Fig. 10.2)
4. Inspect to make sure horizontal diagonal bracing (plan bracing) has been placed near the bottom, top, and at 20′ intervals measured from the rolling surface. (Fig. 10.4)
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 ensure 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 and toeboards. (Fig. 10.1)
8. Check to see that all planking is properly installed.
9. Check that the load on the caster does not exceed the capacity of the caster.
10. Check that access ladder is correctly installed.
11. Check that the caster is pinned to the scaffold with toggle pins.

CAUTION
NEVER RIDE A ROLLING TOWER. CAREFULLY CHECK THAT EACH CASTER IS PROPERLY BRAKED & PINNED BEFORE USE.

Fig. 10.2 WACO® offers Casters, especially designed for use with Rolling Scaffolds. They are available in 5″ and 8″ diameters and are equipped with a brake permitting the user to lock the wheel in position.

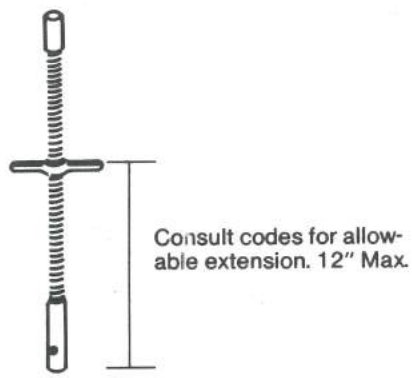


Fig. 10.3 Caster wheels can be used with #0306-00 Adjustment Screw which allows adjustment of tower height.

Fig. 10.4 IMPORTANT RULE—When assembling a rolling tower, ALWAYS USE HORIZONTAL BRACES on the frame section. This prevents the tower from "racking" (getting out of square). Horizontal braces must be used at the bottom and at every 20′ height on rolling towers measured from the rolling surface.

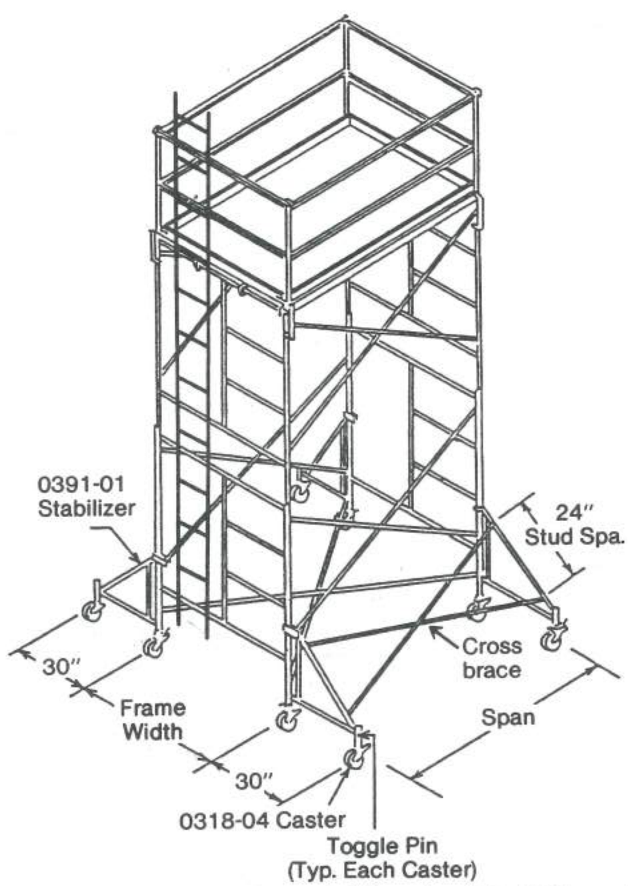


Fig. 10.5 Model #0391-01 stabilizer leg. Wt. 12 lbs. not including optional caster or base plate. Increases base width up to a maximum of 60″ per pair. Cross braces must always be used with the stabilizer legs.

SECTION 11
GUYED SCAFFOLDS

Free standing scaffold towers with height to base ratio of more than 4:1 must be restrained from tipping by guying or other means. (Federal O.S.H.A.)

Generally, guying is a subject requiring careful design and in all cases should be checked and approved by an engineer. However, when instructions are given and guys have to be erected and maintained throughout the structure's standing time, it is essential for all persons concerned to be familiar with the following procedure for Erection, Maintenance and Dismantling.

IMPORTANT

NEVER GUY TO OTHER STRUCTURES WITHOUT PERMISSION

ERECTION: (See Fig. 11.1)

All guys will be steel wire ropes, either Tirfor ropes or similar. *Natural or Man-made fiber ropes must not be used.*

All guys when placed must have an equal and opposite guy.

All ropes must be tied off at a suitable ground anchor and the other end connected to the scaffold must be fixed with a minimum of three Crosby clips.

All ropes shall be nominally pre-tensioned to remove the slack, either by Tirfor winch, Pullift, come-along clamps (See Fig. 11.2). To avoid distortion of the scaffold this operation should be carried out under the supervision of an experienced erector.

> **CAUTION**
> REMEMBER - SLACK GUYS ARE USELESS: OVERTAUT GUYS ARE DANGEROUS.

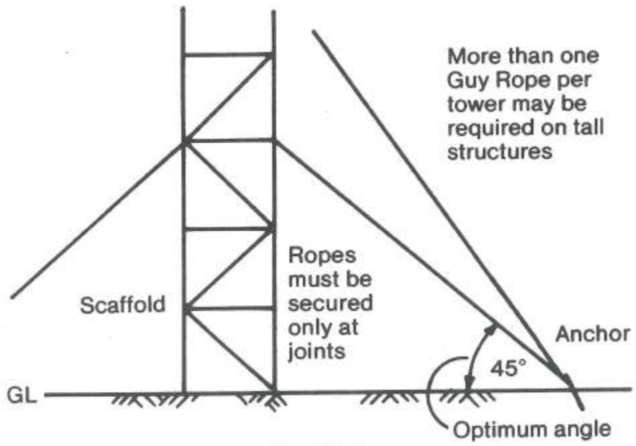


Fig. 11.1

MAINTENANCE:

The guyed structure must be regularly and frequently inspected for strained or slack ropes and anchorages particularly after high winds have occurred or prior to forcasted bad weather.

The ropes must be kept taut at all times.

DISMANTLING:

When dismantling a guyed scaffold, the guys must only be removed when their attachment points on the scaffold are reached during the downward process of dismantling, not at the start of dismantling.

Consideration must be given to refixing the guys at a lower level if the partially dismantled scaffold is unsafe when key guys are first removed. Guy wires should not be dropped on the ground or dragged through the mud.

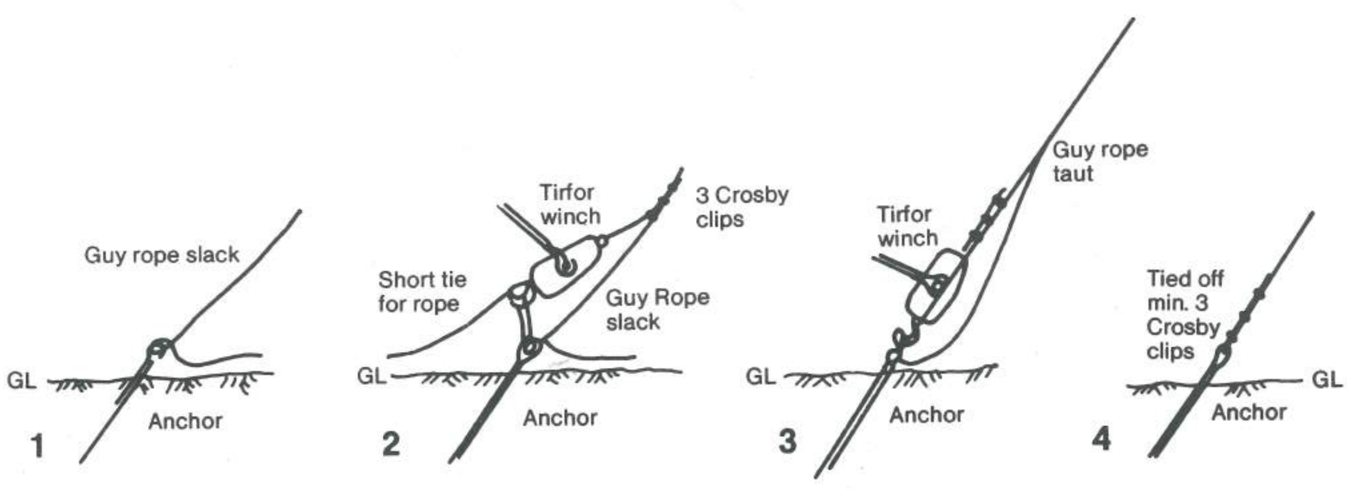


Fig. 11.2 **1.** Make off guy rope temporary. **2.** Fit By-pass winch and rope to anchor and guy. **3.** Tension guy with winch slack end or guy pulled up and clamped. **4.** Remove winch and check clamps.

SECTION 12
ENCLOSED SCAFFOLD

Enclosed scaffolds should be erected and designed by persons qualified to do so.

The projected area of the scaffold when covered with plastic will increase by a factor of at least fifty. This means that even with wind speed less than thirty miles per hour, very large forces act on the scaffold. These forces can either push the scaffold against the building or pull it away from the face of the building on the lee side of a structure. When working on an enclosed scaffold you should expect to see at least the following. If not, check that the scaffold was designed by a person qualified to do so.

As a minimum ties should be spaced every 13 feet vertically and every 14 feet horizontally. All ties should be capable of withstanding compression and tension loads of at least 1500 pounds.

The above minimum is based on a scaffold sixty feet high and with a maximum of thirty mile per hour winds. If your scaffold exceeds these or is in an exposed area more precautions may be necessary.

Check the following points:

1. All ties are "positive type" (See Section 6.)
2. All ties are located as close as possible to the ledgers.
3. All frames are fastened together with toggle pins.
4. Enclosure material is fastened to the frame, not the cross braces.
5. Ventilation is provided to prevent carbon monoxide poisoning, especially where combustion-type heating is used.
6. Ties every 13' vertically X 14' horizontally would be normal for enclosed scaffolds in 30 mph winds. See Section 6 for ties.
7. No. 9 wire ties should have at least 4 strands.

CAUTION
CHECK THAT SCAFFOLD IS ADEQUATELY TIED AND CHECK TIES REGULARLY, ESPECIALLY PRIOR TO AND AFTER HEAVY WIND.

SECTION 13
PERSONAL PROTECTIVE EQUIPMENT

O.S.H.A. requires the employer to be responsible for requiring the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions.

A careful check should be made of all local regulations to check what protective equipment is required and when it should be worn.

SECTION 14
CANTILEVER OR OVERHANG SCAFFOLD

Sometimes it's necessary to erect a cantilever scaffold. A cantilevered scaffold is one in which a substantial portion of the weight of the scaffold is outside the base dimension of the scaffold. Because it is overhung, it is less stable than a scaffold that is built straight up and down.

Fig. 14.1 (next page) is an example of a cantilevered scaffold. A putlog clamped to the scaffold tower on the roof extends out over the parapet and narrow frames are hung from it.

IMPORTANT:
These precautions must be observed when laying out a cantilevered scaffold:

The cantilevered section of the scaffold should not be overloaded so there is danger of tipping. Because of the overhang, the structure is not stable without the use of counterweights. These must be calculated for the loading conditions of each job by a person qualified to do so.

Care should be taken that the cantilevered members are not overloaded.

Be sure to check the roof or floor on which the scaffold will set to be certain it will support all of the loads to be put on it.

We strongly urge you to check your cantilevered jobs with Waco's Engineering Department.

CAUTION
CHECK ALL SAFETY EQUIPMENT DAILY PRIOR TO USING. DO NOT USE FLUIDS OR POWDERS FOR COUNTERWEIGHTS.

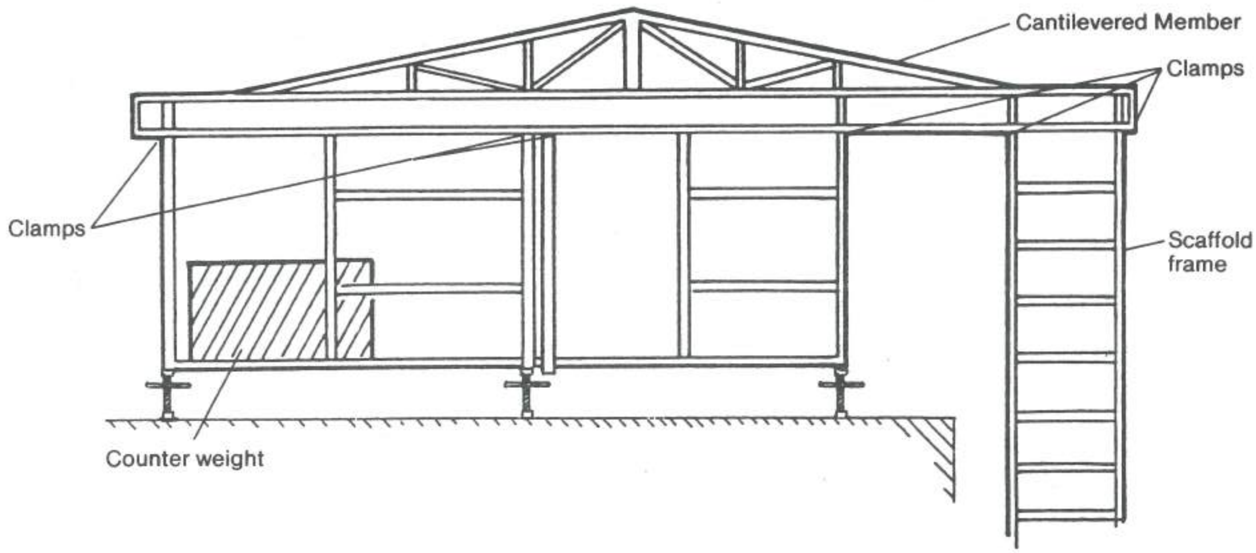


Fig. 14.1 This is an example of a cantilevered scaffold. A Putlog clamped to the scaffold tower on the roof extends out over the parapet and narrow frames are hung from it.

CAUTION
CLAMPS AND CONNECTIONS USED BETWEEN VARIOUS COMPONENTS MUST BE ADEQUATE FOR THE LOADS APPLIED.

PART C. SPECIFIC REQUIREMENTS FOR SCAFFOLD EQUIPMENT

SECTION 15
FRAME SCAFFOLD

O.S.H.A. refers to frame scaffolds as sectional steel scaffold.

There are two basic components to a frame scaffold — the frame and the cross brace. These are combined in various positions to produce taller or longer scaffolds. See Fig. 15.1 and 15.2.

Depending on the application, the user has to choose the frame height and spacing between frames and, hence, the cross brace size.

FRAME SELECTION

Scaffold frames are available in two basic configurations — the end frame and the walk-through frame.

End frames for sectional scaffolding come in two basic widths — the standard 5'0" wide end frames in the various shapes shown, and the 27-5/8" wide narrow frames shown. (Fig. 15.3)

The height selected will depend on trade or union preferences and the nature of the work. The 6'6" high frames are practical for higher scaffolds because fewer units need to be assembled or dismantled for a given height and their higher overhead clearance makes them easy to walk through. Extension frames and end frames allow you to build scaffolding to any convenient heights and to tier or contour it to suit ceiling contours, projections, etc. (Fig. 15.3).

On exterior walls, the walk through frame is frequently used. When combined with side brackets it allows maximum clearance and freedom of movement.

Heavy Duty Spacer and Horizontal Diagonal Brace

The heavy duty spacer (gooser) is used for spacing or bracing scaffold elements. It is made in several lengths as shown in Fig. 15.4. The spacer is often used as either a handrail or a midrail. For rolling towers, the horizontal diagonal brace is mandatory.

Access Onto Scaffold

O.S.H.A. requires that adequate means of access is given to the scaffold platform. Options include the use of a scaffold accessway (See Fig. 15.19), the use of hook-on and attachable ladders, and the use of integral prefabricated scaffold access frames (See Figs. 15.17 and 15.18).

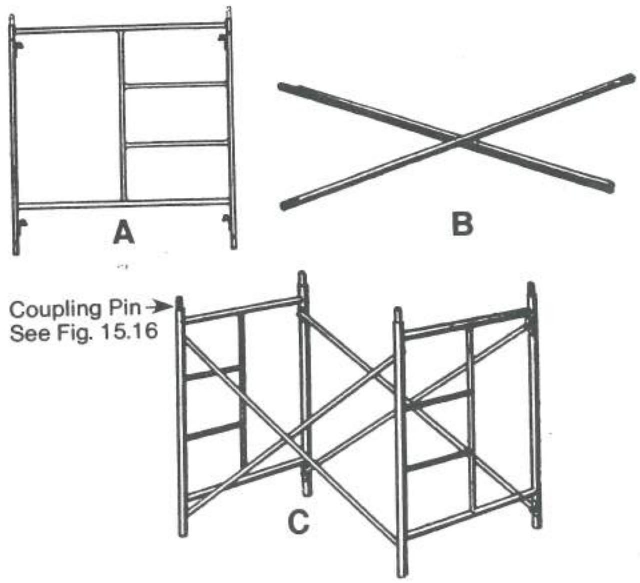


Fig. 15.1 There are 2 basic parts to Waco Scaffolding, End Frames **(A)** and Cross Braces **(B)**. 2 End Frames + 2 Cross Braces = A Basic Section **(C)**.

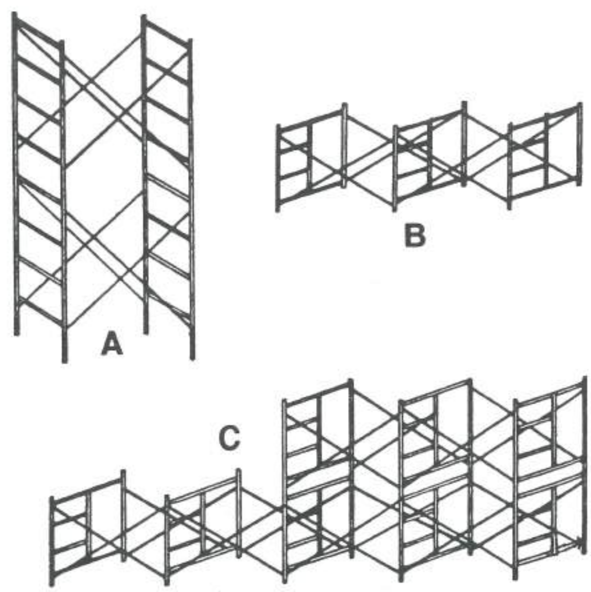
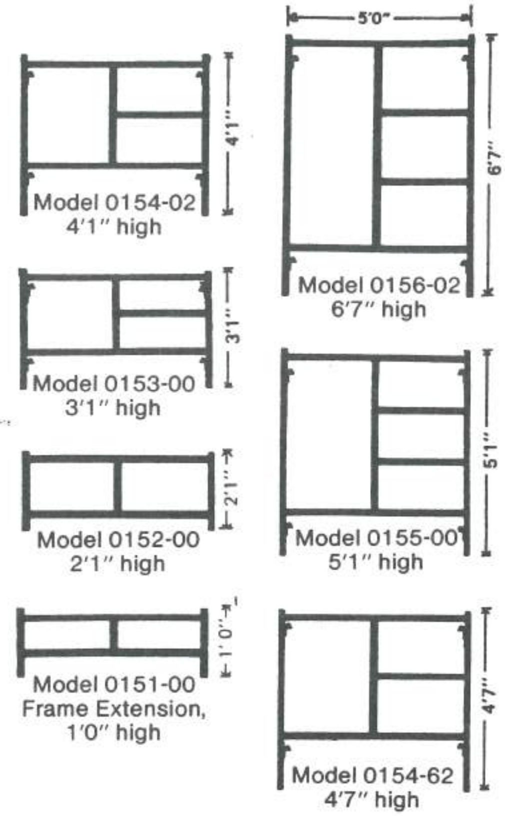
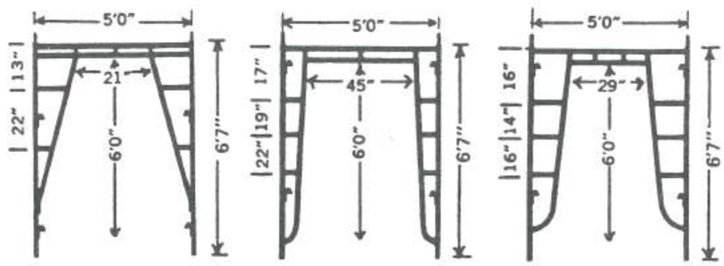


Fig. 15.2 Then, expand the basic sections UP as in towers **(A)** or OUT as in runs **(B)** or BOTH **(C)**.

STANDARD END FRAMES



WALK THROUGH FRAMES



Model 0156-05 Model 0156-06 Model 0156-07

Note: All vertical dimensions indicate leg height. Legs extend 1" above ledger—on all frames.

NARROW FRAMES

Narrow Frames come in three heights — 6'7", 5'1" and 3'1". Width is 27 ⅝" center to center of leg.

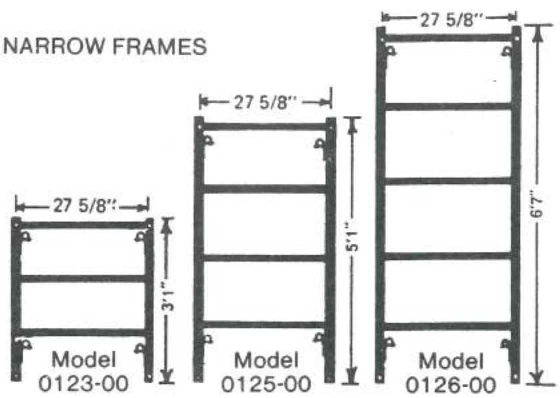
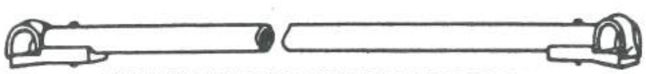


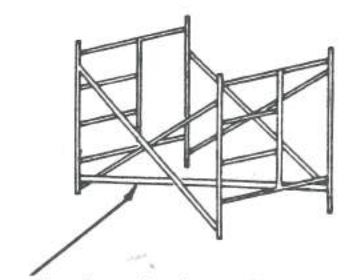
Fig. 15.3



HORIZONTAL DIAGONAL BRACE (GOOSER)

• Used as a Spacer

Model 0267-05 gives you 5' spacing
Model 0267-06 gives you 6' spacing
Model 0267-07 gives you 7' spacing
Model 0267-10 gives you 10' spacing



• Used as a horizontal diagonal brace on 5'0" wide frames.

Model 0265-05 for 5' spacing
Model 0265-06 for 6' spacing
Model 0265-07 for 7' spacing
Model 0265-10 for 10' spacing

• Used as a horizontal diagonal brace on narrow (27 ⅝" wide) frames.

Model 0262-05 for 5' spacing
Model 0262-06 for 6' spacing
Model 0262-07 for 7' spacing
Model 0262-10 for 10' spacing

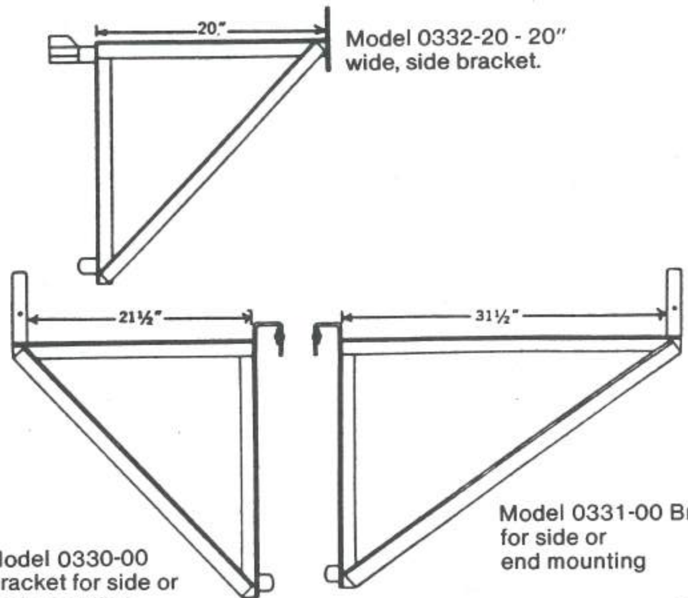
Fig. 15.4

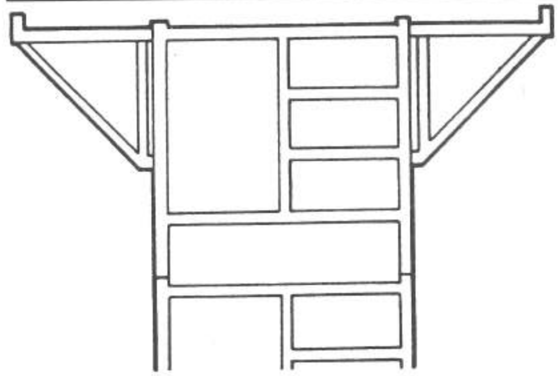
Waco Side Bracket

Side Brackets are used to extend the effective width or length of scaffold and provide a wider working platform. WACO Side Brackets are quickly and easily fastened to Frames. All Brackets should be seated correctly with brackets either parallel to the frames or in the case of "side or end mounting" brackets they can be parallel with the braces.

CAUTION

BRACKETS ARE TO BE USED AS LIGHT DUTY WORK PLATFORMS ONLY AND SHOULD NOT BE USED FOR STORAGE OF MATERIAL OR EQUIPMENT.





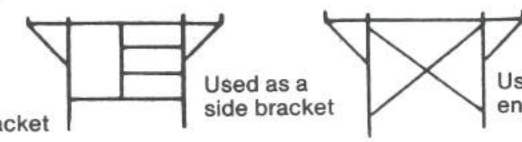
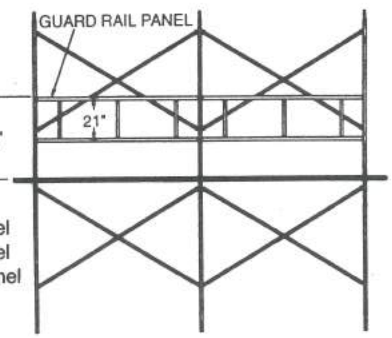


Fig. 15.5 Waco® Side Bracket

Waco® Hoist Standard

The Waco #0345-00 Hoist Standard, which is pinned to the top of any frame provides an easy method of raising up to 100 lbs. of material to the top of the scaffold. The Hoist Standard is slipped over the coupling pin and pinned to the leg. The head, which is complete with a 12" well wheel, which holds rope up to 1" thick, swivels so materials may be swung over the scaffold platforms. Always use 2 #0200-00 Toggle Pins to hold Hoist Standard to frame leg.



Model No.	Description
032777	7' Guard Rail Panel
032888	8' Guard Rail Panel
031010	10' Guard Rail Panel

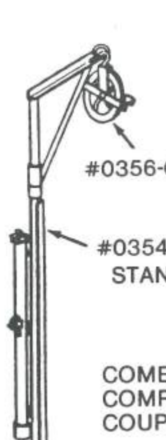
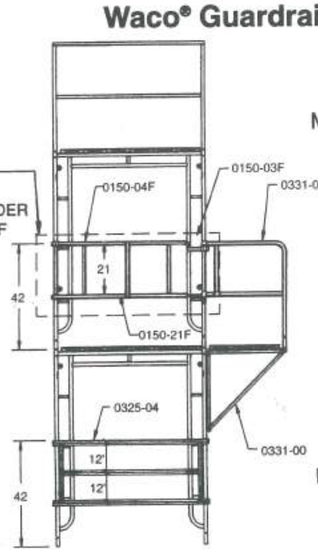


Fig. 15.6 Waco® Hoist Standard

Waco® Guardrail & Endgate Assembly



Model No.	Description
033101	2'-6' Bracket Guard Rail
032504	5' Hanging Guard Rail
015005	5' End Gate Assembly

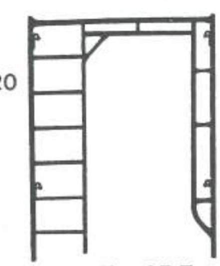


Fig. 15.7

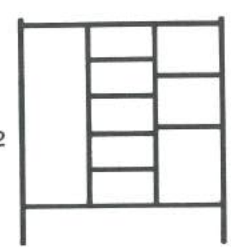


Fig. 15.8 Access Frames

Erection of Frame Scaffolds

The frame scaffold is easy to erect provided you start your erection the correct distance from the building and you accurately align and level the first lifts carefully. For the foundations, refer to Chapter 4. Uneven ground requires special precaution when using frame scaffolds.

The easiest and most practical way to handle this is to start your first frame on the highest point. From this, build your scaffold along the wall, filling in to bring it up to the proper level.

Fig. 15.9
#0202-00 CLAMP

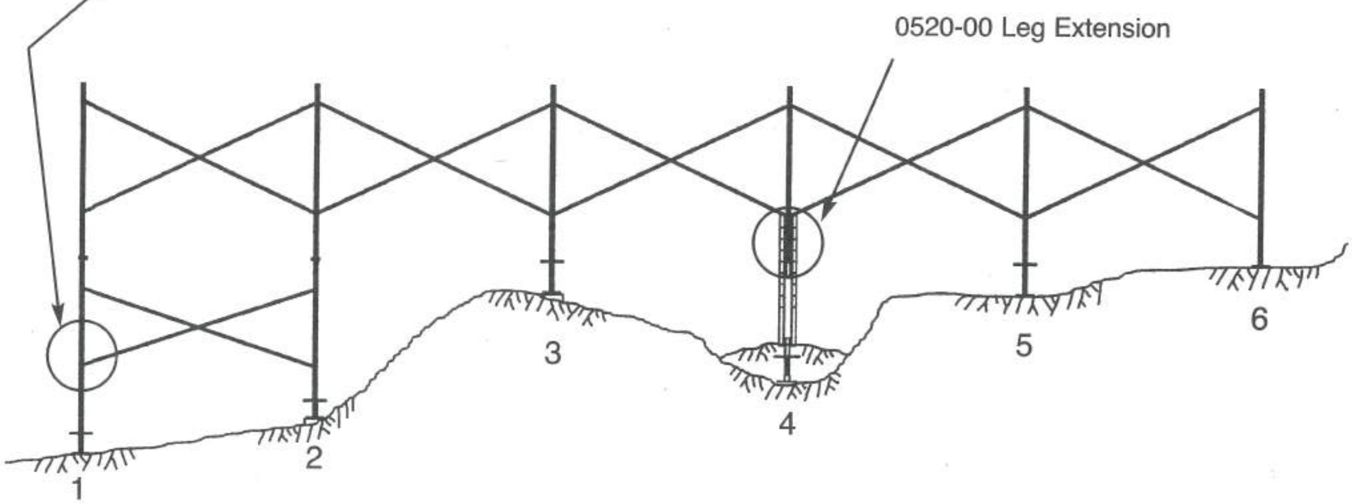


Fig. 15.10 IN THIS SAMPLE, A ROW OF 0155'S WAS BEING LEVELED. TO MAKE ADJUSTMENTS FOR THE DIFFERENCE IN ELEVATIONS, THE FOLLOWING EQUIPMENT WAS USED AT EACH OF THE LOCATIONS 1 THROUGH 6.

1. An 0155-00 5 ft. frame and an 0305-00 adjustment screw
2. An 0153-00 3 ft. frame and an 0305-00 adjustment screw
3. An 0306-00 adjustment screw with a 0300-00 base plate
4. 0520-00 Leg Extension
5. An 0305-00 adjustment screw
6. This is the high point; 0300-00 base plate

At 1, an 0253-07 cross brace was used to connect the 0155-00 frame at point 1 and the 0153-00 frame used at point 2. As the brace was too small to fit on the bottom stud of the 0155-00 frame, an 0202-00 clamp was used to fasten the brace on at this point. At 2 here, because of a hole in the ground, a 0520-00 leg extension was used.

Cross Braces

Cross braces come in two types and various lengths.

- Single hole braces 0255-XX Series
- Double hole braces 0244-XX Series

Length of braces selected will depend on the length of the planks to be used, weight the scaffold must support, and area to be covered. Double hole brace can be used on different sized frames to obtain the same frame spacing.

Straddle Braces

Straddle braces are available in 7'0" and 10'0" lengths. Permits scaffolding to be erected over obstructions. Purpose is to straddle furniture, machinery, materials, etc., or to allow worker traffic under scaffolding. Fig. 15.11.

Cross Brace and Straddle Brace Selection

Fig. 15.12 shows the model number of the cross brace or straddle brace that is used to achieve spans of various lengths between frames. For instance to produce an 8' span between two #0153-00 frames, use #0253-08 cross braces. Spans, other than those listed below, are also available.

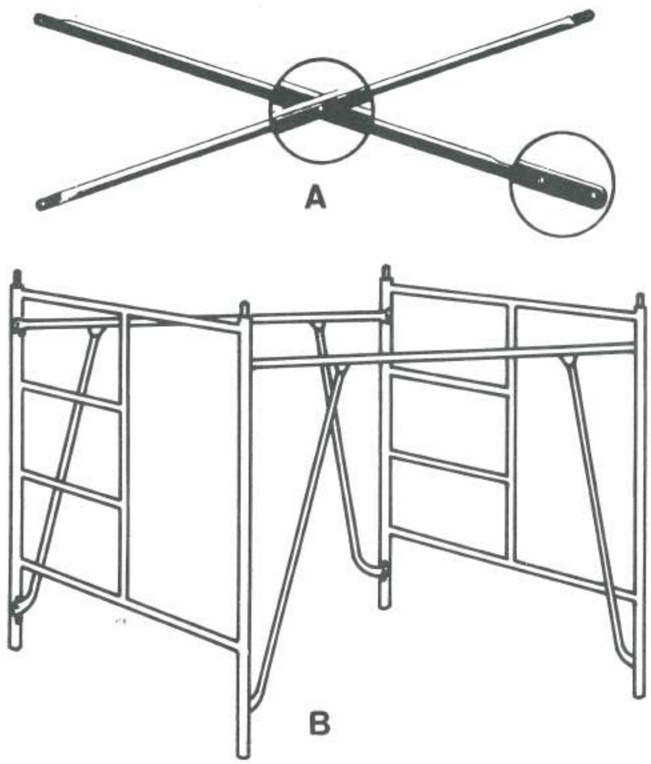


Fig. 15.11 **A.** Cross braces. **B.** Straddle Braces

SPAN AND TYPE OF BRACE

Part #	Size	CROSSBRACE (Frame Spacing)					
		4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	10'-0"
0152-00	5'W x 2'H	0252-04	0252-05	0252-06	0252-07	0252-08	0252-10
0153-00	5'W x 3'H	0253-04	0253-05	0253-06	0253-07	0253-08	0253-10
0154-01 0154-02 0154-03	5'W x 4'H	0254-04 0244-04*	0254-05 0244-05*	0254-06 0244-06*	0254-07 0244-07*	0254-08 0244-08*	0254-10 0244-10*
0154-61 0154-62 0154-63	5'W x 4'6"H	0254-04 0244-04*	0254-05 0244-05*	0254-06 0244-06*	0254-07 0244-07*	0254-08 0244-08*	0254-10* 0244-10*
0155-00	5'W x 5'H	0255-04 0244-04**	0255-05 0244-05**	0255-06 0244-06**	0255-07 0244-07**	0255-08 0244-08**	0255-10 0244-10**
0156-00 ALL TYPES	5'W x 6'6"H	0255-04 0244-04**	0255-05 0244-05**	0255-06 0244-06**	0255-07 0244-07**	0255-08 0244-08**	0255-10 0244-10**

FRAME #	STRADDLE	
	7'-0"	10'-0"
0152-00	—	—
0153-00	—	—
0154-01 0154-02 0154-03	0214-07	—
0154-61 0154-62 0154-63	0214-07	—
0155-00	0215-07	0215-10
0156-00 ALL TYPES	0215-07	0215-10

*Indicates Inside Hole **Indicates Outside Hole

Fig. 15.12

Calculating Number of Frames and Braces Required

After determining how high you will go with the scaffold and the preferred height of the frames, select the number of frames and braces needed for the length of the run by referring to this table.

CAUTION
ALLOWABLE PLANK SPAN AND SCAFFOLD LOADING MUST BE VERIFIED TO BE IN ACCORDANCE WITH FEDERAL AND STATE REGULATIONS.

NO. OF FRAMES HIGH	4′ 1″ FRAMES	4′ 7″ FRAMES	5′ 1″ FRAMES	6′ 7″ FRAMES		LENGTH OF SCAFFOLD 7′	14′	21′	28′	35′	42′	49′	56′	63′	70′	77′	84′	91′	98′	105′	112′	119′	126′	133′
1.	4′ 1″	4′ 7″	5′ 1″	6′ 7″	FR.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
					BR.	**2**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**
2.	8′ 2″	9′ 2″	10′ 2″	13′ 2″	FR.	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
					BR.	**4**	**8**	**12**	**16**	**20**	**24**	**28**	**32**	**36**	**40**	**44**	**48**	**52**	**56**	**60**	**64**	**68**	**72**	**76**
3.	12′ 3″	13′ 9″	15′ 3″	19′ 9″	FR.	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
					BR.	**6**	**12**	**18**	**24**	**30**	**36**	**42**	**48**	**54**	**60**	**66**	**72**	**78**	**84**	**90**	**96**	**102**	**108**	**114**
4.	16′ 4″	18′ 4″	20′ 4″	26′ 4″	FR.	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	78
					BR.	**8**	**16**	**24**	**32**	**40**	**48**	**56**	**64**	**72**	**80**	**88**	**96**	**104**	**112**	**120**	**128**	**136**	**144**	**152**
5.	20′ 5″	22′ 11″	25′ 5″	32′ 11″	FR.	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
					BR.	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**	**130**	**140**	**150**	**160**	**170**	**180**	**190**
6.	24′ 6″	27′ 6″	30′ 6″	39′ 6″	FR.	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
					BR.	**12**	**24**	**36**	**48**	**60**	**72**	**84**	**96**	**108**	**120**	**132**	**144**	**156**	**168**	**180**	**192**	**204**	**216**	**228**
7.	28′ 7″	32′ 1″	35′ 7″	46′ 1″	FR.	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
					BR.	**14**	**28**	**42**	**56**	**70**	**84**	**98**	**112**	**126**	**140**	**154**	**168**	**182**	**196**	**210**	**224**	**238**	**252**	**266**
8.	32′ 8″	36′ 8″	40′ 8″	52′ 8″	FR.	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160
					BR.	**16**	**32**	**48**	**64**	**80**	**96**	**112**	**128**	**144**	**160**	**176**	**192**	**208**	**224**	**240**	**256**	**272**	**288**	**304**
9.	36′ 9″	41′ 3″	45′ 9″	59′ 3″	FR.	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180
					BR.	**18**	**36**	**54**	**72**	**90**	**108**	**126**	**144**	**162**	**180**	**198**	**216**	**234**	**252**	**270**	**288**	**306**	**324**	**342**
10.	40′ 10″	45′ 10″	50′ 10″	65′ 10″	FR.	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
					BR.	**20**	**40**	**60**	**80**	**100**	**120**	**140**	**160**	**180**	**200**	**220**	**240**	**260**	**280**	**300**	**320**	**340**	**360**	**380**
11.	44′ 11″	50′ 5″	55′ 11″	72′ 5″	FR.	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220
					BR.	**22**	**44**	**66**	**88**	**110**	**132**	**154**	**176**	**198**	**220**	**242**	**264**	**286**	**308**	**330**	**352**	**374**	**396**	**414**
12.	49′ 0″	55′ 0″	61′ 0″	79′ 0″	FR.	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
					BR.	**24**	**48**	**72**	**96**	**120**	**144**	**168**	**192**	**216**	**240**	**264**	**288**	**312**	**336**	**360**	**384**	**408**	**432**	**456**
13.	52′ 1″	59′ 7″	66′ 1″	85′ 7″	FR.	26	39	52	65	78	91	104	117	130	143	156	169	182	195	208	221	234	247	260
					BR.	**26**	**52**	**78**	**104**	**130**	**156**	**182**	**208**	**234**	**260**	**286**	**312**	**338**	**364**	**390**	**416**	**442**	**468**	**496**
14.	57′ 2″	64′ 2″	71′ 2″	92′ 2″	FR.	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224	238	252	266	280
					BR.	**28**	**56**	**84**	**112**	**140**	**168**	**196**	**224**	**252**	**260**	**308**	**336**	**364**	**392**	**420**	**448**	**476**	**504**	**532**

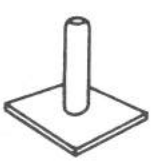
Fig. 15.13

Bold figures indicate number of braces

Waco Base Plates and Screws

All fixed (non-moveable) scaffolds must be set on base plates and sills as required.

ADJUSTING SCREWS



0300-00

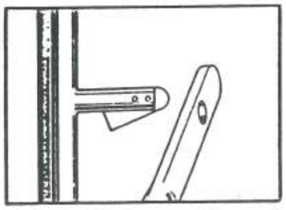
STATIONARY BASE PLATE fits directly under the frame. Can only be used on a level surface where no adjustment is required.

0305-00
2″ - 12″ extension to scaffold height.

0305-18
2″ - 18″ extension to scaffold height.

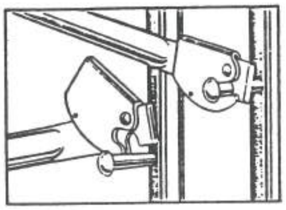
0306-00
Used with 0300-00 base plate - 9″ - 25″ extension to scaffold height.

Fig. 15.14 Waco® Base Plates and Screws



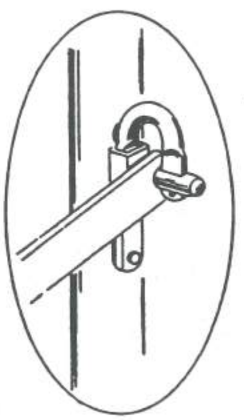
GRAVITY LOCK

The Gravity Lock has a pivoting metal tab in the center of the pin which allows the cross brace to slide onto the pin and then drops into the locking position once the brace is past the metal tab. In order to dismantle the frame, the metal tab must be manually raised with one hand while sliding the cross brace off with the other hand. Gravity Locks are standard on Waco Blue frames, and are optionally available on Waco Red frames.



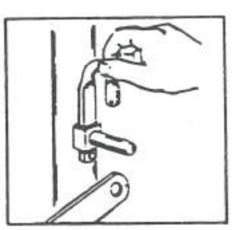
AUTO-LOCK

The Auto-Lock system uses a rivet head pin on the frame with the locking and release mechanism in the cross brace. The brace ends have a gravity-actuated flag which opens when it is forced down over the body of the pin and, once fully in position, closes automatically around the pin. This speeds erection, as one person can attach the cross brace from a single position. Auto-Lock is an available option for both Waco Red and Blue.

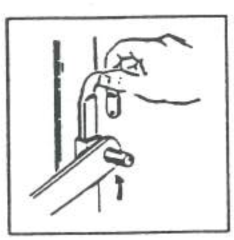


The Waco® Speedlock® is the heart of the Waco system because it secures braces to end frames. Drawings show how easy it is to use. It is a forged lock.

The Speedlock will hold one brace as necessary in towers, or two as needed in runs of scaffolding.



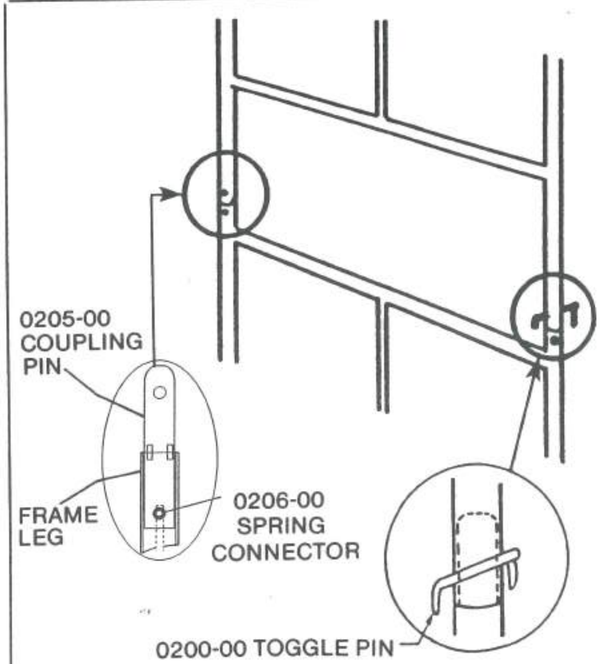
A. Lift Speedlock. Retaining pin allows it to be raised far enough to permit attachment of brace.



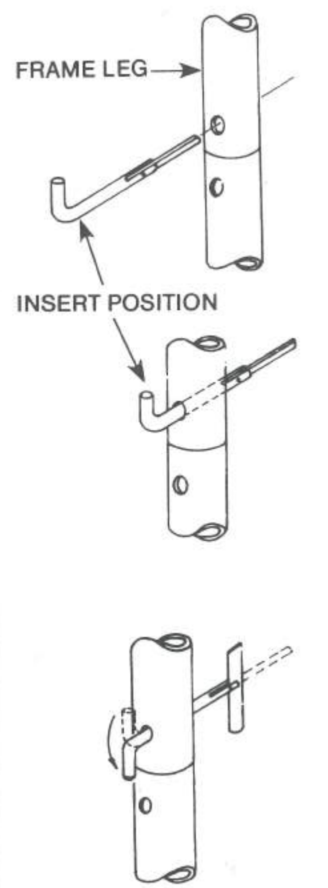
B. Brace is attached by slipping end over the Speedlock stud. Release Speedlock and brace is secured in place.

Fig. 15.15 Your choice of locks

There are three locking systems available on Waco frames — Speedlock®, Gravity Lock, and Auto-Lock®. Please specify the type of locking system when ordering Waco frames.



When building rolling towers, or when uplift of frames could occur, frames should be locked together with Toggle Pins, or with bolts and nuts.

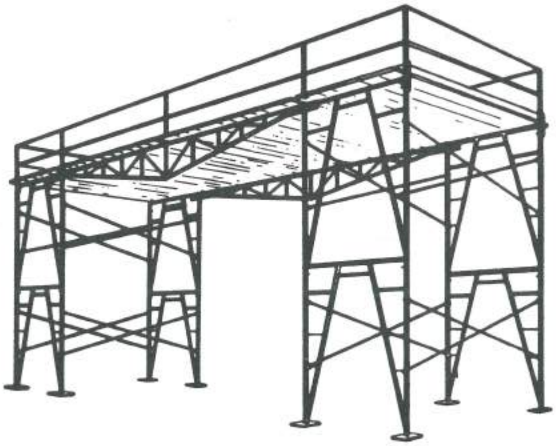


0200-00 TOGGLE PIN

Rotate shank of Toggle Pin and gravity will cause the latch to fall into locked position. Reverse operation to remove the Toggle Pin.

The Toggle Pin is a quick and easy method for assembly and disassembly of two products. If a more permanent assembly is desired, the use of a ⅜" bolt with washer is recommended.

Fig. 15.16 The Waco® Coupling Pin is used to stack one frame on top of another when you're building the scaffolding up. The Coupling Pin is designed to permit building up frames one leg at a time.

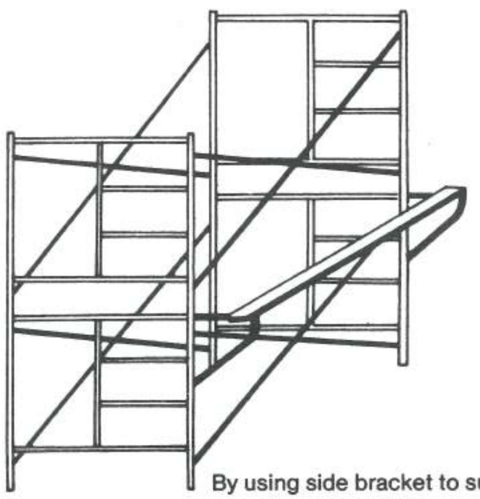


If the obstructions are extremely wide, Putlogs may be used to bridge them like this.

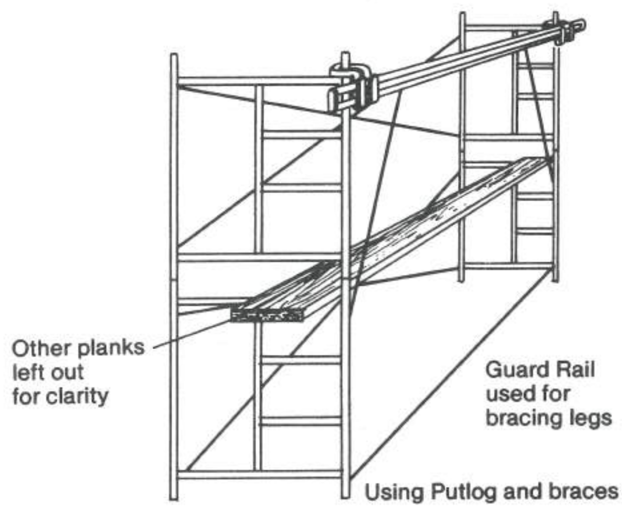
Sometimes, using Straddle Braces will solve the problem.

In rare cases, tubes and clamps may be the only solution to clearing obstructions.

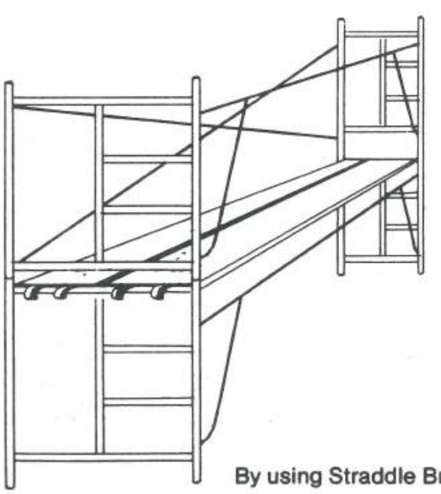
HOW TO KEEP CROSS-BRACING OUT OF WORK AREA



By using side bracket to support plank



Using Putlog and braces



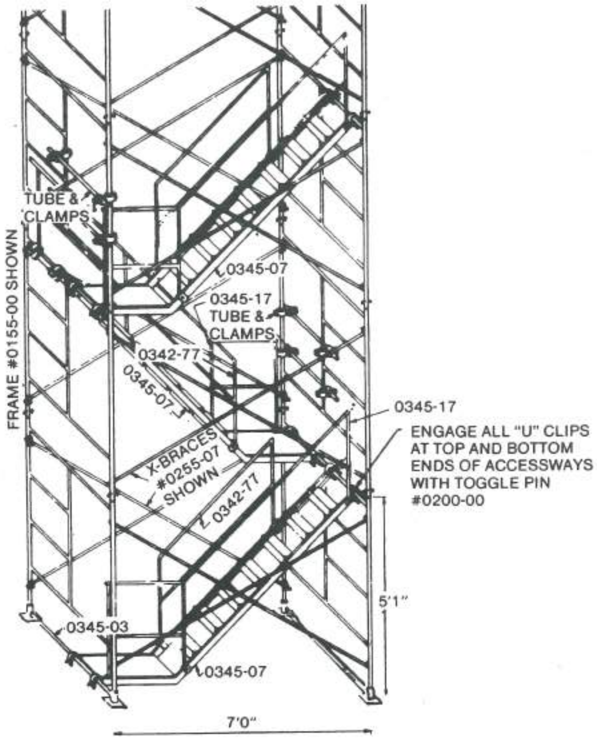
By using Straddle Brace

CAUTION
FIGURES ARE FOR
ILLUSTRATION PURPOSES ONLY.

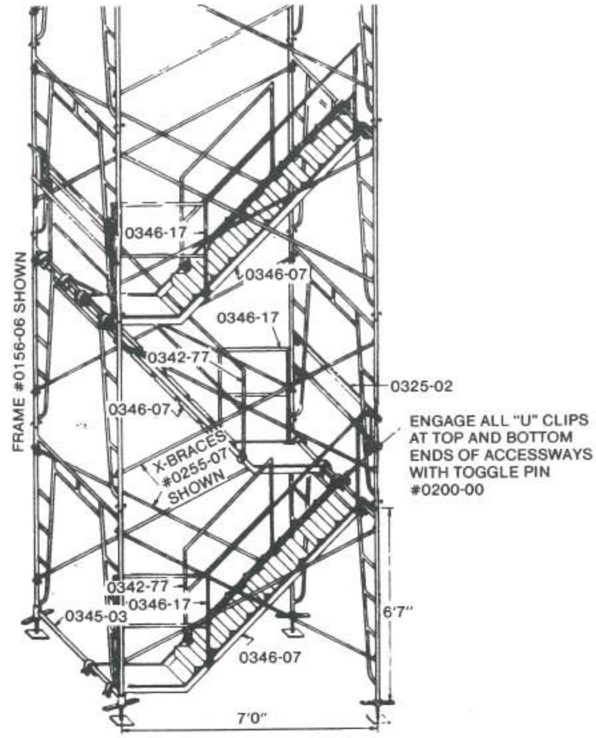
Fig. 15.18 Obstructions are the main problem indoors

USED WITH STANDARD SCAFFOLD FRAMES

WACO ALL STEEL 24" WIDE INTERNAL ACCESSWAYS ALLOW EASY ACCESS TO VARIOUS LEVELS WITH INTERNAL AND EXTERNAL HAND RAILS.



MODEL 0345-07 USED ON 0155-00 FRAMES



MODEL 0346-07 SHOWN ON 0156-00 FRAMES

BOTTOM OF FIRST ACCESSWAY MUST BE SUPPORTED BY 0345-03 STARTER UNIT. ONE 0345-03 REQUIRED IF BASE SCREWS ARE USED. TWO 0345-03 REQUIRED IF BASE PLATES ARE USED.

NOTES:

(A) 0342-77 INTERIOR HANDRAIL IS ATTACHED TO INSIDE MEMBER OF EITHER 0345-07 OR 0346-07 ACCESSWAY W/(2) 3/8" o X 2 1/4" LONG BOLT W/NUT & LOCKWASHER (FURNISHED).

(B) 0345-17 EXTERIOR HANDRAIL FOR 5'1" FRAME IS ATTACHED TO OUTSIDE MEMBER OF 0345-07 ACCESSWAY* W/(2) 3/8" o X 3" LONG BOLT W/LOCKWASHER (FURNISHED).

(C) 0346-17 EXTERIOR HANDRAIL FOR 6'7" FRAME IS ATTACHED TO OUTSIDE MEMBER OF 0346-07 ACCESSWAY* W/(2) 3/8" o X 3" LONG BOLT W/LOCKWASHER (FURNISHED).

(D) ACCESSWAYS MUST BE TIED TO EXISTING STRUCTURE OR GUYED EVERY THIRD FRAME HIGH. FOLLOW FEDERAL, STATE AND LOCAL CODES.

(E) TOGGLE PIN (#0200-00) MAY BE USED IN PLACE OF NUTS AND BOLTS IN (A), (B), and (C).

ITEM NUMBER	DESCRIPTION	WEIGHT
0345-03	Starter Unit (2 per tower)	10
0345-07	Accessway for 5' high frames	81.7
0346-07	Accessway for 6'6" high frames	94.9
0342-77	Handrail Assy. (internal) all sizes	16.0
0345-17	Handrail Assy. (external -- 5' frames)	29.6
0346-17	Handrail Assy. (external -- 6'6" frames)	28
A0346-07	Accessway for 0156-02, 0156-05, 0156-06 and 0156-07 (6'-7" frame)	50.0
0325-04	Hanging Guardrail For 0156-05, 0156-06and 0156-07 Frames.	13.0

*IMPORTANT NOTE: 0345-07 AND 0346-07 ACCESSWAYS MANUFACTURED BEFORE 8/75 REQUIRE HOLES ADDED TO OUTSIDE MEMBER IN ORDER TO ATTACH EXTERNAL HANDRAIL.

Fig. 15.19

SECTION 16
TUBE AND COUPLER SCAFFOLDS

A tube and coupler scaffold is a scaffold made up of many lengths of 2″ diameter tube clamped together in such a way that a rigid structure is formed.

The way the tube is clamped together is all important. If the tubes are not properly connected and adequately braced, the scaffold will not be safe.

The scaffolders should have suitable experience and reliability commensurate with the complexity of the scaffold to be erected.

Tube and coupler scaffolds are assembled from three basic structural elements: the uprights, or posts, which rise from the ground or other solid support; the bearers, which support the working platforms and/or provide transverse horizontal connections between the posts; and the runners, which attach to the posts directly below the bearers and provide longitudinal connections along the length of the scaffold. These three elements are usually connected with double couplers which provide a 90 degree connection in two places. These three elements form the basic structure shown in Fig. 16.3 and are repeated in the horizontal and vertical planes to build the scaffold to its desired size and egg-crate type configuration with the components and fittings shown in Fig. 16.3.

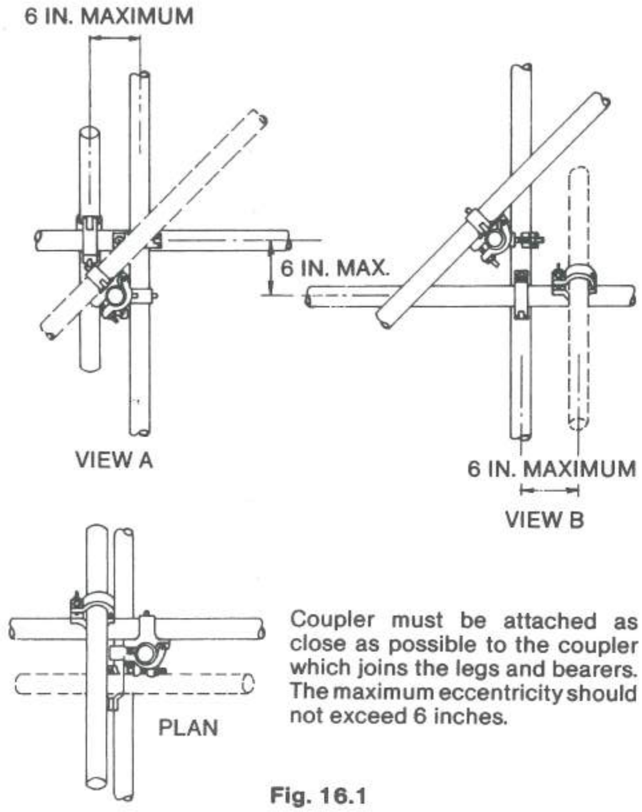
Bearers should be installed transversely between posts and must be securely coupled to the posts and bearing on the runner coupler. When it is necessary to couple directly to the runners, the coupler must be kept as close to the post as possible. Bearers should be at least 4″ but not more than 12″ longer than the post spacing or runner spacing.

Runners should be erected along the length of the scaffold, located on both the inside and the outside posts at even height. They should be interlocked to form continuous lengths and coupled to each post. The bottom runners should be located as close to the base as possible. Runners should be placed not more than 6′6″ on centers.

Diagonal bracing is used to stiffen the structure as necessary — most importantly in the longitudinal direction. Bracing is generally connected to the posts with "adjustable" or "swivel" couplers which have the facility of adjusting a full 360 degrees so that two members in parallel planes are connectable at any angle.

Cross bracing should be installed across the width of the scaffold at least every third set of posts horizontally and every fourth runner vertically. Such bracing should extend diagonally from the inner and outer runners upward to the next outer and inner runners.

Longitudinal diagonal bracing on the inner and outer rows of poles shall be installed at approximately a 45 degree angle from near the base of the first outer post upward to the extreme top of the scaffold. Where the longitudinal length of the scaffold permits, such bracing must be duplicated



Coupler must be attached as close as possible to the coupler which joins the legs and bearers. The maximum eccentricity should not exceed 6 inches.

Fig. 16.1

beginning at every fifth post. In a similar manner, longitudinal diagonal bracing must also be installed from the last post extending back and upward toward the first post. Where conditions preclude the attachment of this bracing to the posts, it may be attached to the runners.

Node points are where a number of tubes converge on the structure. The degree of eccentricity should be minimized as shown in Fig. 16.1a in order to avoid excessive eccentricities and bending in the tubes.

Braces should be connected as near as possible to the nodes as shown in Fig 16.1. Where continuous diagonal brace tubes are used it is essential that they connect at every node point as shown in Fig. 16.1. The conditions shown in Fig. 16.2 illustrate that the buckling load required to produce failure in Fig. 16.2 (a) and (b) is much less than in (c) because the buckling lengths are longer.

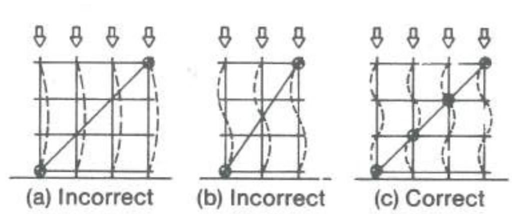


Fig. 16.2 Brace coupler position

FASTUBE Scaffolding

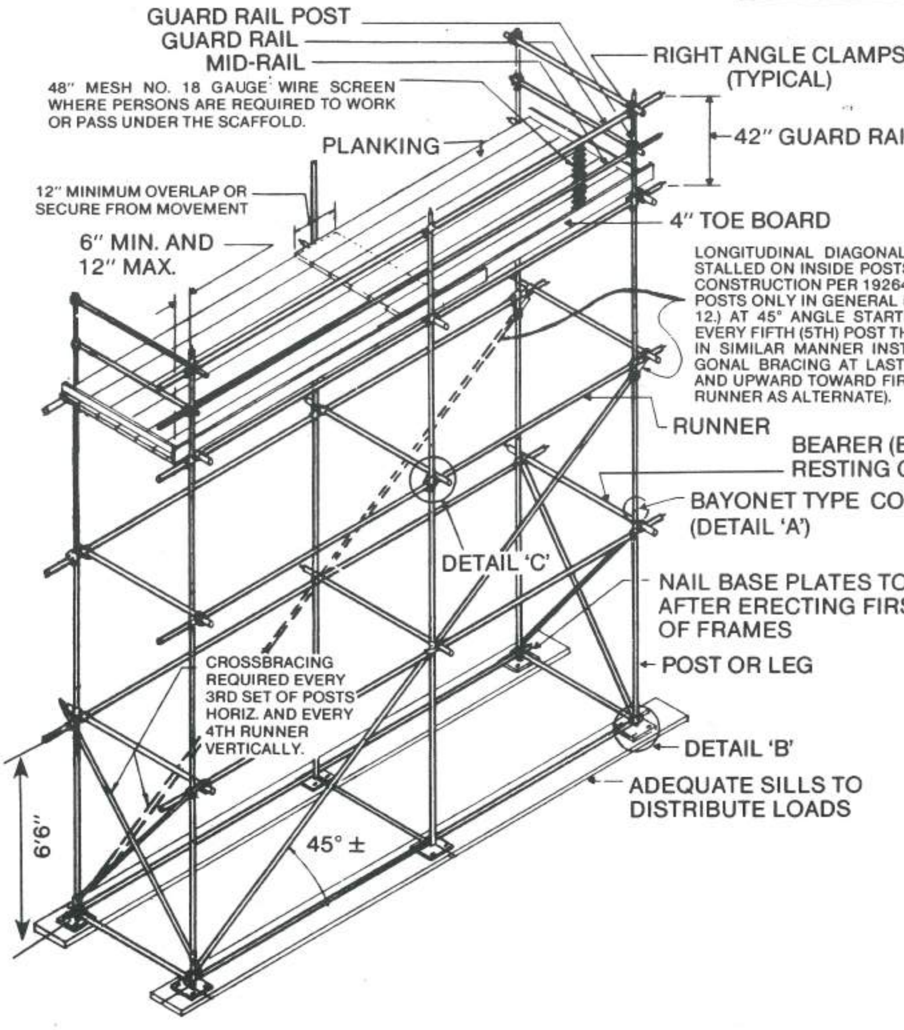
FASTUBE members can be spaced as desired both vertically and horizontally. Uneven ground conditions, unusual shapes and complex structures are easily handled with FASTUBE. See OSHA and local codes for loading and spacing regulations. The Fastube system is comprised of only four basic parts: end-fitting tubing, swivel clamp, right angle clamp, and base plate. Fastube has 2" nominal outside diameter.

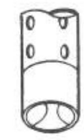
Ties (see fig. 6.2) should be rigid and of the push/pull type.

The entire scaffold shall be tied to and securely braced against the building at intervals not to exceed 30 feet horizontally and every 26 feet vertically when the scaffold is greater than 3 feet wide, and 20 feet vertically when the scaffold is 3 feet or narrower. These are the maximum allowable spacings, and in many circumstances, ties are required more frequently.

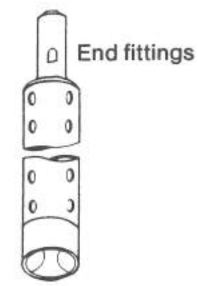
IMPORTANT

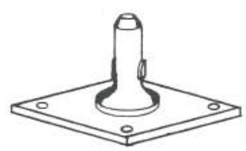
THE BRACES ACROSS THE WIDTH OF THE SCAFFOLD COMBINED WITH THE TIES ARE THE MOST IMPORTANT PART OF THE SCAFFOLD. THEY ARE ALSO THE TWO ITEMS IN A SCAFFOLD WHICH ARE MOST OFTEN LEFT OUT AND THE MOST COMMON CAUSE OF FAILURE.





DETAIL A

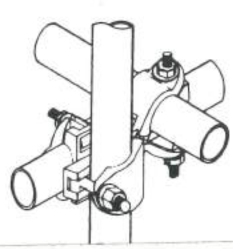




DETAIL 'B'

Model 0482-01
Base plate

BASE PLATE MAY BE ROUND OR SQUARE AS SHOWN.



DETAIL 'C'
Model
0422-01
Right angle clamp

MODEL—TUBE LENGTH

4080-04	4'0"	ALL WITH END FITTINGS
0480-05	5'0"	
0480-06	6'0"	
0480-07	7'0"	
0480-08	8'0"	
0480-09	9'0"	
0480-10	10'0"	
0480-12	12'0"	
0480-13	13'0"	
0480-14	14'0"	
0480-16	16'0"	
0480-18	18'0"	
0480-20	20'0"	

Model 0421-01 Swivel clamp

CAUTION

TUBE AND COUPLER DESIGN IS COMPLEX AND THIS SECTION IS A BRIEF OVERVIEW. ALL TUBE AND COUPLER SCAFFOLDS SHOULD BE DESIGNED BY A PERSON QUALIFIED TO DO SO.

Fig. 16.3

SYSTEM SCAFFOLDING

CAUTION

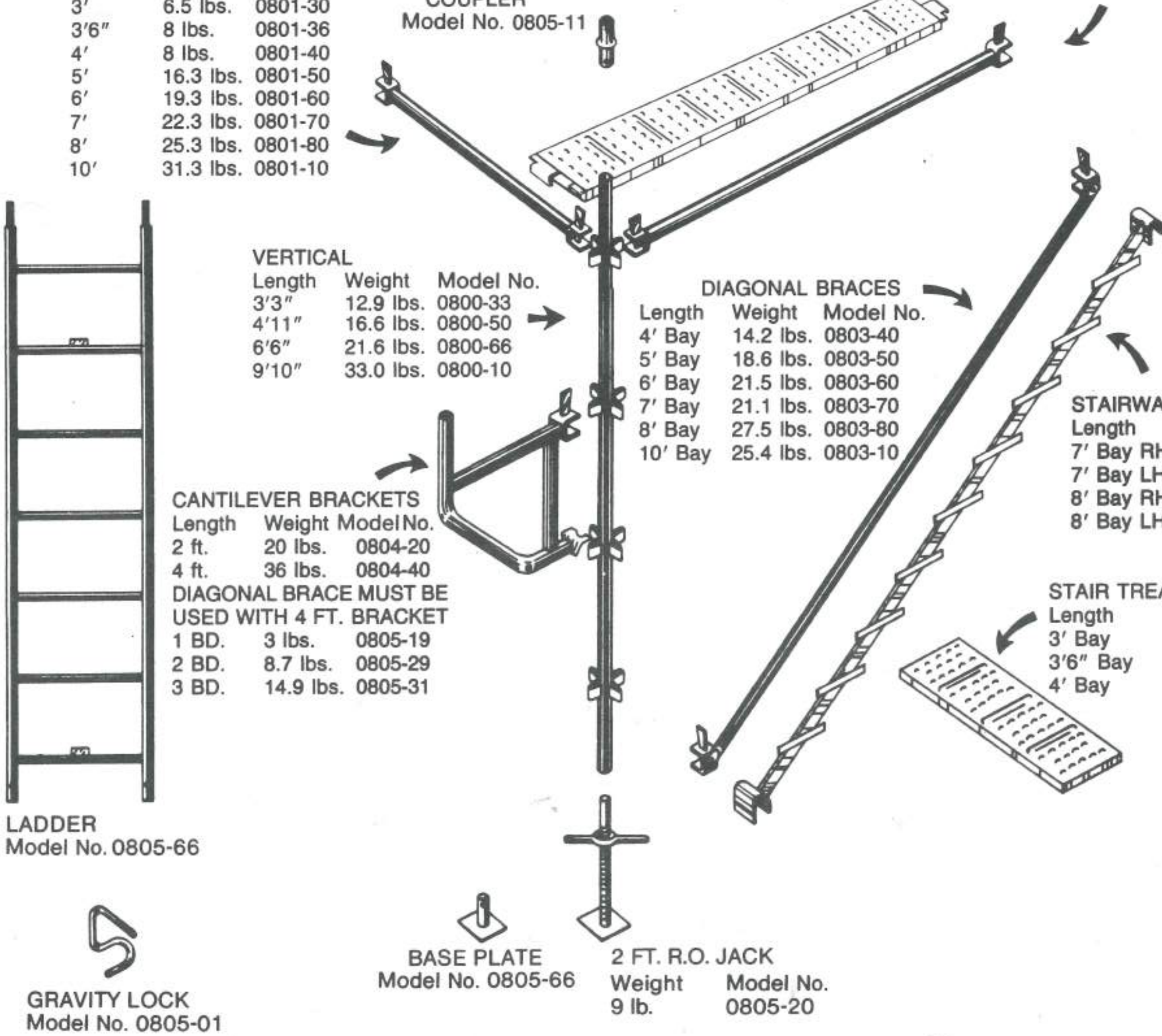
THIS SECTION IS A BRIEF INTRODUCTION TO WEDGELOK. FOR FURTHER INFORMATION CONTACT WACO ENGINEERING DEPARTMENT.

Waco Wedgelok®

Waco Wedgelok assembles quickly and easily with one man. Each vertical has clusters every 20". The horizontal braces have captive wedges at each end which are placed into the appropriate cluster. A hammer, the only tool required for complete assembly, is used to set the wedge. As the wedge is driven, it pulls the "C" flange against the post, locking it securely from any movement.

The Wedgelok system is not restricted by the size or shape of the structure like standard frame scaffolding. Nor is the system restricted to 90 degree or 45 degree connections. The unique radiused "C" flange and socket permits a full 60 degree (30 degrees either side of center) angle adjustment to hug radius work.

A complete selection of accessory pieces ensures that your Wedgelok system will conform to any odd-shaped internal or external access problem areas.



STEEL PLANKS

Length	Weight	Model No.
2′	10.1 lbs.	0806-20
2′6″	12.5 lbs.	0806-26
3′	15 lbs.	0806-30
3′6″	17.1 lbs.	0806-36
4′	19.2 lbs.	0806-40
5′	23.4 lbs.	0806-50
6′	31.7 lbs.	0806-60
7′	31.3 lbs.	0806-70
8′	39.6 lbs.	0806-80
10′	44.4 lbs.	0806-10

LEDGER

Length	Weight	Model No.
5 ft.	10.7 lbs.	0802-50
6 ft.	13 lbs.	0802-60
7 ft.	14.5 lbs.	0802-70
8 ft.	17 lbs.	0802-80
10 ft.	20.1 lbs.	0802-10

TRANSOM

Length	Weight	Model No.
2′	4.5 lbs.	0801-20
2′6″	6 lbs.	0801-26
3′	6.5 lbs.	0801-30
3′6″	8 lbs.	0801-36
4′	8 lbs.	0801-40
5′	16.3 lbs.	0801-50
6′	19.3 lbs.	0801-60
7′	22.3 lbs.	0801-70
8′	25.3 lbs.	0801-80
10′	31.3 lbs.	0801-10

COUPLER
Model No. 0805-11

VERTICAL

Length	Weight	Model No.
3′3″	12.9 lbs.	0800-33
4′11″	16.6 lbs.	0800-50
6′6″	21.6 lbs.	0800-66
9′10″	33.0 lbs.	0800-10

DIAGONAL BRACES

Length	Weight	Model No.
4′ Bay	14.2 lbs.	0803-40
5′ Bay	18.6 lbs.	0803-50
6′ Bay	21.5 lbs.	0803-60
7′ Bay	21.1 lbs.	0803-70
8′ Bay	27.5 lbs.	0803-80
10′ Bay	25.4 lbs.	0803-10

STAIRWAY STRINGER

Length	Weight	Model No.
7′ Bay RH	41.7 lbs.	0805-71
7′ Bay LH	41.7 lbs.	0805-75
8′ Bay RH	43.3 lbs.	0805-82
8′ Bay LH	43.3 lbs.	0805-83

CANTILEVER BRACKETS

Length	Weight	Model No.
2 ft.	20 lbs.	0804-20
4 ft.	36 lbs.	0804-40

DIAGONAL BRACE MUST BE USED WITH 4 FT. BRACKET

1 BD.	3 lbs.	0805-19
2 BD.	8.7 lbs.	0805-29
3 BD.	14.9 lbs.	0805-31

STAIR TREAD

Length	Model No.
3′ Bay	0805-30
3′6″ Bay	0805-36
4′ Bay	0805-40

LADDER
Model No. 0805-66

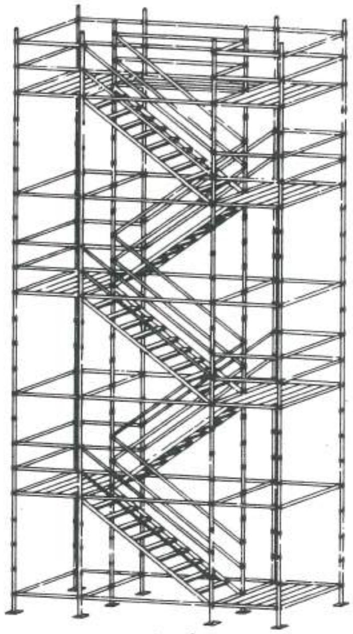
GRAVITY LOCK
Model No. 0805-01

BASE PLATE
Model No. 0805-66

2 FT. R.O. JACK

Weight	Model No.
9 lb.	0805-20

Fig. 17.1 Waco Wedgelok®



1

Verticals

Verticals are provided in four bas
joints welded at 1' 7-11/16" interva
The removable coupler design al
jacks with various adapters or fork
A coupler at the top of each vertic
end connections to meet the requir
heights.

Ledgers (Non-Load Bearing)

(NOT TO BE USED FOR PLANK SU

These horizontals are not desig
O.S.H.A. defined light duty live load ra

Description:

A horizontal tubular member of the
The ledger ties the standards toge
by means of a wedge which engages
vertical. The ledgers also serve
midrails.