

HI-LITE 25K ALUMINUM SHORING



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Introduction3

Features & Benefits -25K Aluminum Shoring	4	Wedge Clamps	19
Product Information-25KIP Product Line	8	Beam Clips and T-Bolts	20
Frame Identification	8	Hi-Lite Aluminum Beams & Splice Plates	21
Screw Jacks and Accessories	9	Cross Braces	22
Frame Accessories	10	Section II Assembly and Instructions	23
Product Components –Features and Detail	11	Assembly of Frames	23
25K Aluminum Frames	11	Step-By-Step Procedure:	24
Horizontal Ledgers	12	Economical Setup Procedures	26
Jetlock Assembly	13	Description of Various Set-Up Combinations	26
Screwjacks	14	TOWER SET-UP ILLUSTRATIONS	27
Base Plates	15	Tower Capacities- 25K	30
Extension Tubes	16	Tower Capacities with Jacks only or Equivalent Extension	30
U-Head	17	Lateral Bracing	31
Extension Tube Support Pin	17	Maintaining High Tower Load Ratings	32
Base Plate Adapter and Coupling Pin	17	Equipment Handling and Assembly Suggestions	33
Saddle Beam	18	Erecting Towers	34
		Safe Design and Erection Practices	37



Introduction

This edition of the Hi-Lite 25K Aluminum Shoring Instruction Manual is the latest update on, what we believe, is the most advanced shoring system on the market today.

The Hi-Lite 25K Aluminum Shoring System is primarily a hand-set system. It can also be handled with a crane, and may also be used quite successfully as a rolling or a flying system.

THIS MANUAL IS PUBLISHED PRIMARILY FOR OUR CUSTOMERS, SHORING DESIGNERS AND THE ERECTORS OF THIS HEAVY LOAD ALUMINUM SHORING SYSTEM.

IT IS INTENDED ONLY AS A GUIDE AND SHOULD BE USED IN CONJUNCTION WITH GENERALLY ACCEPTED SHORING DESIGN AND THE SAFETY REGULATIONS IN EFFECT WITHIN THE AREA AND COUNTRY OF USE.

The purpose of this manual is to simplify the understanding and use of the System.

Each component of the 25K Aluminum Shoring System. is described and illustrated in SECT I (General Information).

The features and benefits of using the Hi-Lite 25K Shoring system are outlined in depth and key elements are cross referenced to particular components.

The Manual in SECT II (Assembly and Instructions) covers various setup arrangements of the equipment; the correct use of the system including handling and maintenance of the equipment.

LOCAL AUTHORITIES AND/OR A LOCALLY REGISTERED PROFESSIONAL ENGINEER SHOULD APPROVE ALL DRAWINGS FOR CONSTRUCTION PURPOSES.

David Jackson
President
HI-LITE SYSTEMS INC



Features & Benefits -25K Aluminum Shoring

1. **Hi-Lite Systems/JASCO**, the original manufacturer of aluminum shoring frames, has applied for patents on components of their *Hi-Lite 25K Aluminum Shoring*. As both the designer and the manufacturer of the system,. we are able to strongly support our customers, in numerous situations, be it in design, layout or use of the product.
2. Hi-Lite's *25K Aluminum Shoring* frames weigh less than half that of comparable capacity steel frames and they can be handled by a single worker. A 6ft high, 4ft wide 25K frame weighs 26.6kg (58.4lbs) compared with the same size steel frames weighing over 50 Kg (110 lbs.). This light weight enables the frames to be hand set. Even more important is the fact that towers can be dismantled by hand in situations where it is very difficult or even impossible to use a crane after the concrete has been poured.
3. Aluminum frames can be manhandled, whereas a crane is necessary for erecting or stacking comparable steel frames.
4. Compared with other aluminum shoring frames, our *25K Aluminum Shoring* has a significantly higher capacity, up to 27,215kg (60,000 lbs) per frame.
5. On the 25 Kip systems the base and/or top plates utilize a patented quick-release feature that is most important. It is not required with up to 7000 kg (15,000lbs) load on a Screwjack adjusting nut, but is essential when loaded from 8000 to 15000 kg (16,000 - 30,000lbs). It normally takes considerable "persuasion" with a good size sledge hammer to loosen the adjusting nut. Now we are able to loosen the Screwjack by using a carpenter's hammer. Our patented quick release taper pin (for further info see pg. 15) eliminates extensive hammering on the adjusting nut to loosen the shoring under heavy loads. One solid hit on the taper pin and the adjusting nut can be released by hand.
6. Our *25K Aluminum Shoring* frames also incorporate many special labor-saving design features:
 - a. The de-mountable horizontal members (for further info see pg. 13) are rectangular, to give the highest strength for the lowest weight.
 - b. The top edge is serrated to resist skidding of planks and to prevent slipping if a worker should climb the frame.
 - c. The legs can be used independently as Post Shores (See separate load charts) providing product versatility for the system.
 - d. Continuous T-bolt slots on the legs allow for attachments to the legs at any location for additional bracing, lacing and/or many other optional accessories.
 - e. The corner gusset bracing is designed to serve not only as a stiffening member, but also to protect the Jetlocks (the Cross Brace locking devices). These corner braces strengthen the frame without obstructing the function of the locks.
 - f. The patented Jetlock c 14) has proven itself over the years to be the fastest and most advanced lock on the market. It is field replaceable using only a small wrench.



25K ALUMINUM SHORING FRAMES

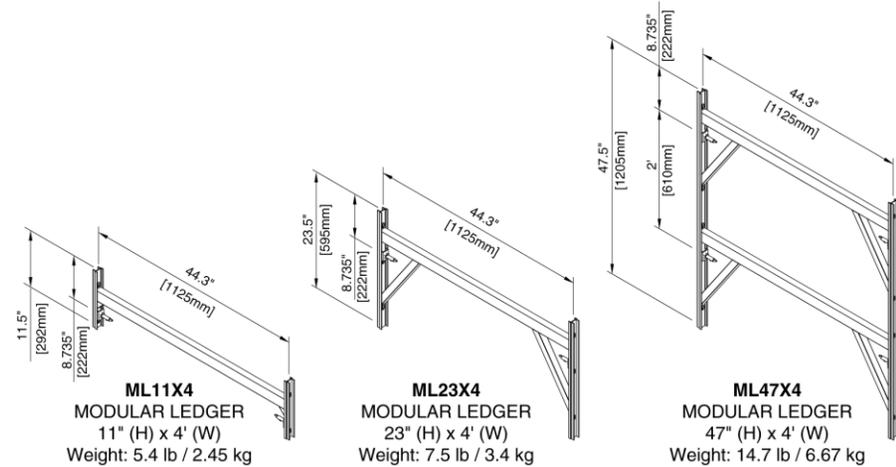
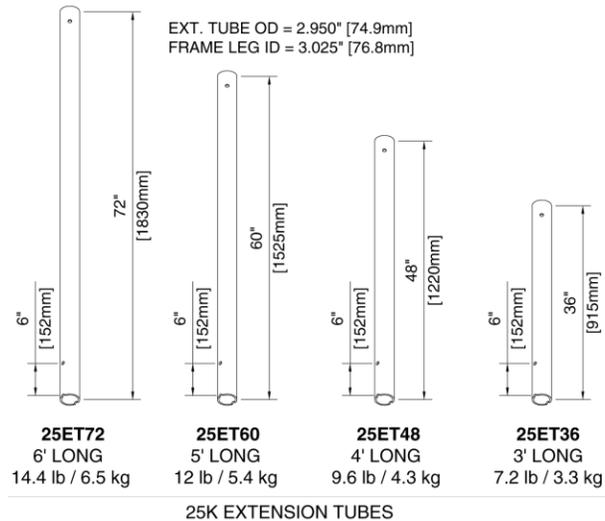
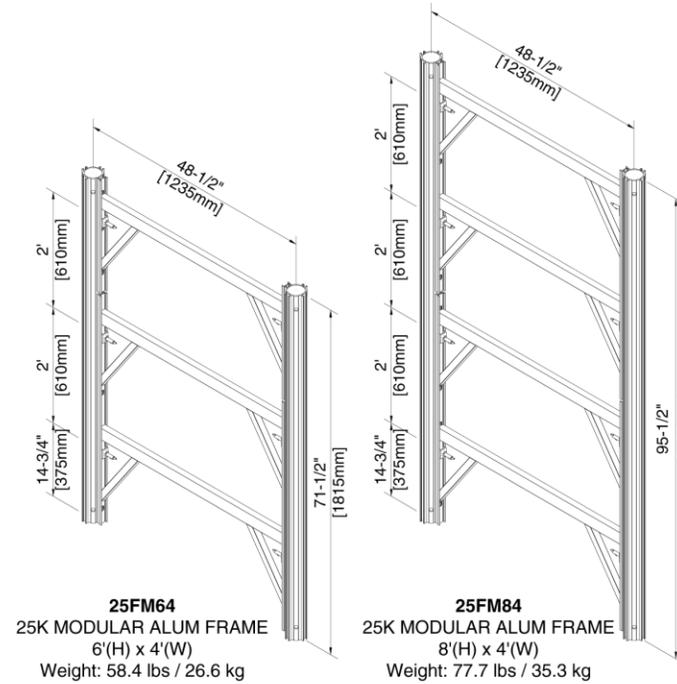
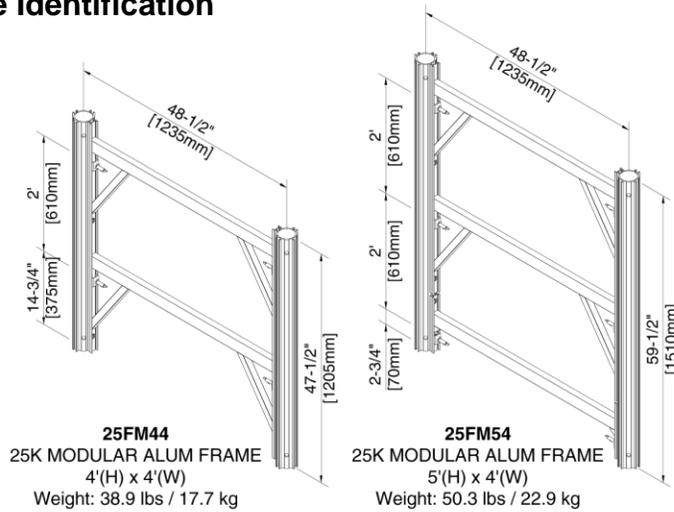
- d. The Coupling Pin is fairly standard within the industry. Although it serves only one purpose, it serves it well, by its size, length, collar, and hole size. One end is swaged to make erection easier. It is made of galvanized steel tubing for strength, low maintenance, durability, and long life. The galvanized steel slides into the aluminum frame leg easily.
- e. The Cross Braces (for further info see pg. 23) have added features, as well. They are precision-made of high tensile strength galvanized steel tubing. They incorporate a special bolt hinge that can be replaced if one side of the Cross Brace gets bent. Cross Braces are made in various lengths, but all fit the 2ft and 4ft stud spacing of the Jetlock. All 6ft and 4ft high frames will accommodate continuous bracing, giving considerable added strength and load-carrying capacity to a multi-frame tower. (See load charts.)
- f. The *25 Kip Aluminum Screwjack* (for further info see pg. 15) is also an outstanding accessory -- with either a fixed plate or a swivel plate -- giving a great deal of benefit to the user of the *25K Aluminum Shoring* system. Its features are numerous. Here are a few: The shaft is made of a special high-strength aluminum alloy, to reduce a good deal of weight and still provide the required load-carrying capability.
- g. The adjusting nut incorporates two large handles for ease of turning and is "stepped" to fit the frame legs and the extension tubes (with no shims or washers), stabilizing the shaft to eliminate all possible wobble. The nut (handle) is made of a special ductile iron that is tough and turns freely on the aluminum legs.
- h. Accessories that further complement the *25 Kip Aluminum Screwjack* serve as base plates re-shore heads and beam plates to positively attach and hold aluminum stringers, joists, wood beams, etc. Both styles of base plates utilize our patented quick-release pin that eliminates extensive hammering of the adjusting nut handles to loosen the shoring under heavy loads; one solid hit on the taper pin and the adjusting nut handle can be turned freely.
- i. The *25 Kip Aluminum Screwjack* with fixed plate serves most applications. Where it is necessary to cope with sloping surfaces and/or other special conditions, the *25 Kip Aluminum Screwjack* with swivel plate takes over. The two styles of Screwjack heads are interchangeable with each other. They have the same shaft and fit into, and are stabilized within, frame legs and extension tubes.
- j. The base and top plates of the *25 Kip Aluminum Screwjack* are so designed that they will securely attach to aluminum stringer beams and joists. A specially designed T-bolt retracts into a socket, allowing the surface of the plates to be flat. The T-bolt has a formed tapered head that eases its insertion into the T-bolt slot of the beams. When the plate is used at the top of a tower or Post Shore, it can rest squarely up against the newly poured concrete slab to act as a re-shore head. When used at the bottom, the plate will rest flat on the ground slab or mud sill.



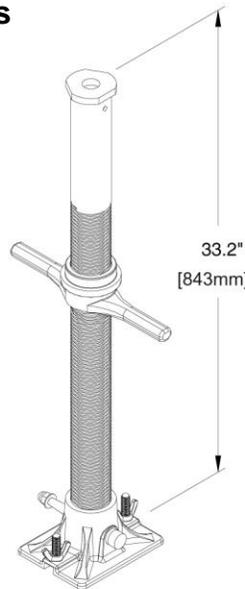
25K ALUMINUM SHORING FRAMES

- k. The same plates can be connected to extension tubes by using the Base Plate Adapter. In this manner, they are used mainly at the bottom of the frame to extend the height of the frame. They can also be used when it is required to firmly connect to a stringer, such as in a rolling form or a Fly Form that is made up from the *25K Aluminum Shoring* frames and components.
 - l. Other components and accessories are also available to use in conjunction with the *25K Aluminum Shoring* system, such as L-heads and U-heads, aluminum tube-and-clamp, etc. (for further info see pgs.18-22)
8. Maintenance is another big savings factor. All accessories are de-mountable, easy to clean, re-plate or replace. *25K Aluminum Shoring* frames require no painting. They do not rust and can be stored outside. They are strong, durable, and easy to handle. They are easily taken apart for storage, if space is at a premium. Jetlocks are easily serviced in the field, or replaced, if necessary.

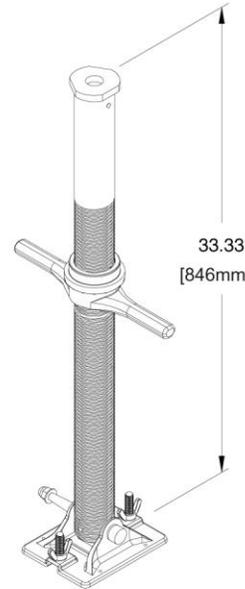
Product Information-25KIP Product Line Frame Identification



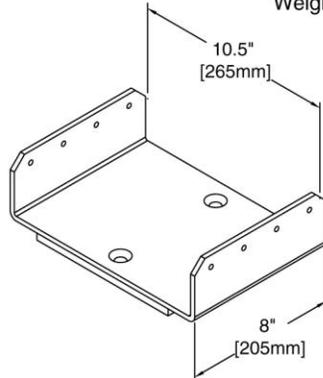
Screw Jacks and Accessories



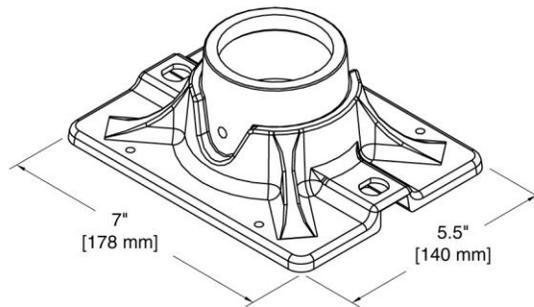
SJ60FX
25K - 60mm SCREWJACK
c/w FIXED BASE PLATE
Weight: 23.8 lb / 10.8 kg



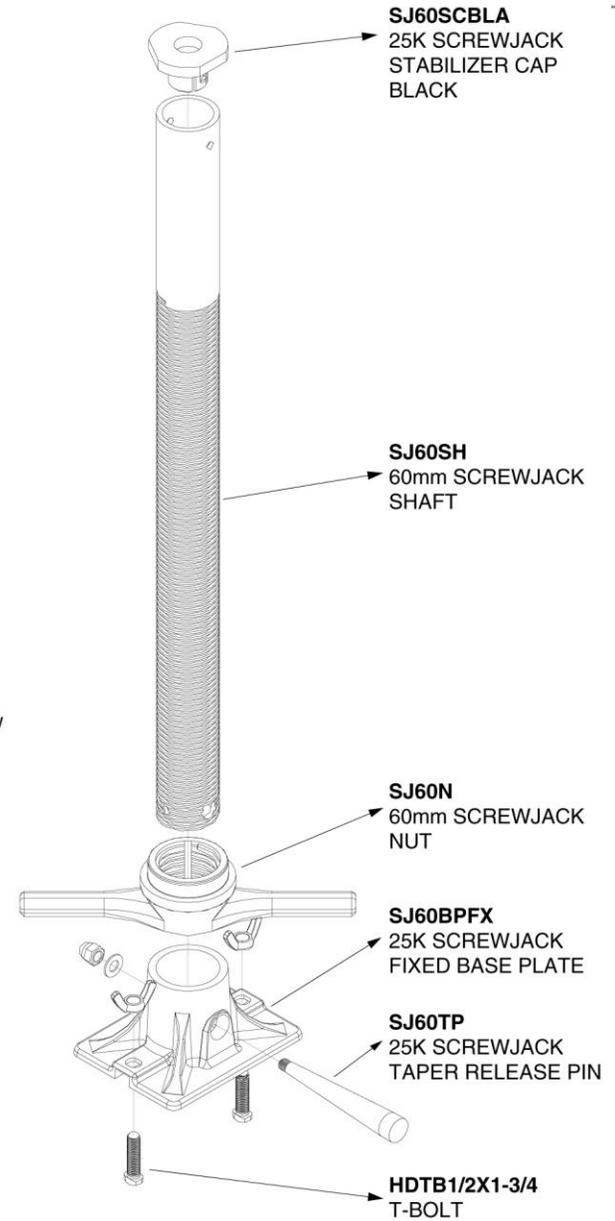
SJ60SW
25K - 60mm SCREWJACK c/w
SWIVEL BASE PLATE
Weight: 22.1 lb / 10.0 kg



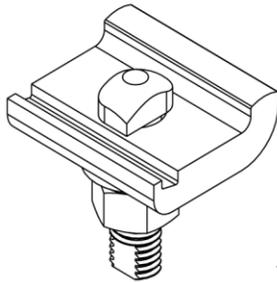
25UHD
25K U-HEAD
Weight: 15.6 lb / 7.0 kg



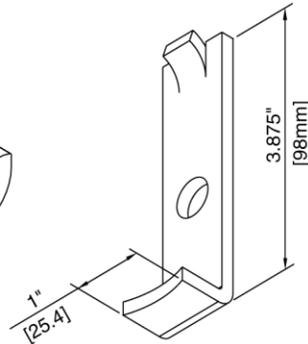
SH25ETBP
25K EXTENSION TUBE BASE PLATE
Weight: 4.0 lb / 1.8 kg



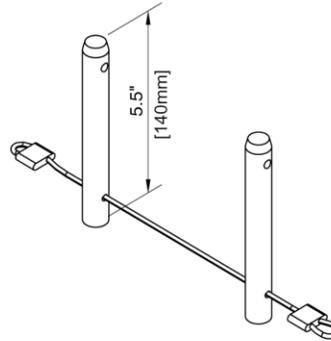
Frame Accessories



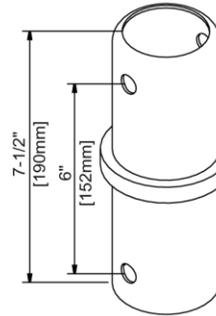
BMALCLPC
ALUM BEAM CLIP
Weight: 0.3 lb / 0.14 kg



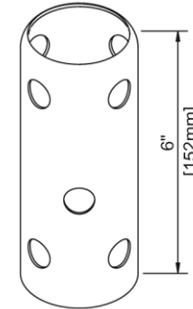
SJRCP
RETAINING CLIP
Weight: 0.3 lb / 0.14 kg



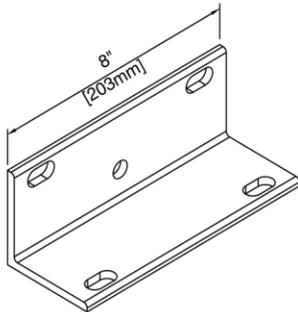
25SP
25K SUPPORT PINS
Weight: 0.8 lb / 0.4 kg



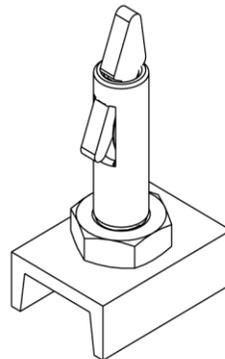
25CP
25K COUPLING PIN
Weight: 1.1 lb / 0.5 kg



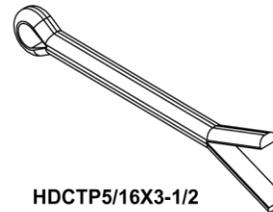
SH60AD
12/16/25K ADAPTER STL
Weight: 0.6 lb / 0.27 kg



CL25LG48P8
25k LEG CLAMP
Weight: 5.7 lb / 2.6 kg



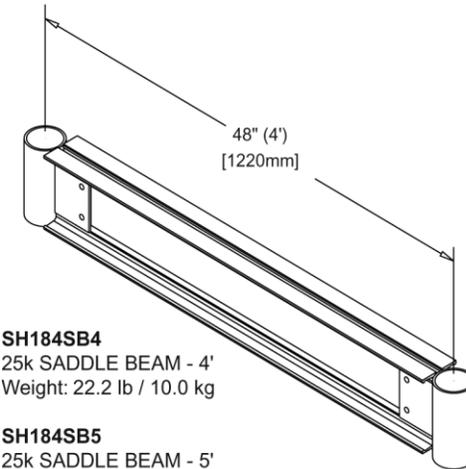
HDJLHC
JET LOCK ASSEMBLY
Weight: 0.1 lb / 0.045 kg



HDCTP5/16X3-1/2
COTTER PIN
Weight: 0.1 lb / 0.05 kg



HDPR1/8
R PIN 1.8" THICK WIRE
Weight: 0.1 lb / 0.045 kg



SH184SB4
25k SADDLE BEAM - 4'
Weight: 22.2 lb / 10.0 kg

SH184SB5
25k SADDLE BEAM - 5'
Weight: 26.4 / 12.0 kg

SH184SB6
25k SADDLE BEAM - 6'
Weight: 30.5 lb / 13.8 kg

Product Components –Features and Detail

25K Aluminum Frames

Hi-Lite's 25K Aluminum Shoring frames are made of a special high-strength aluminum alloy

25FM44	25K Modular Alum Frame 4'x4' HxW Note : frame is made from 2 25LG4 1 ML47X4
25FM54	25K Modular Alum Frame 5'x4' HxW Note : frame is made from 2 25LG5 1 ML47X4 1 ML11X4
25FM64	25K Modular Alum Frame 6'x4' HxW Note : frame is made from 2 25LG6 1 ML47X4 and 1 ML23X4
25FM84	25K Modular Alum Frame 8'x4' HxW Note : frame is made from 2 25LG8 2 ML47X4
25FM55	25K Modular Alum Frame 5'x5' HxW
25FM86	25K Modular Alum Frame 8'x6' HxW

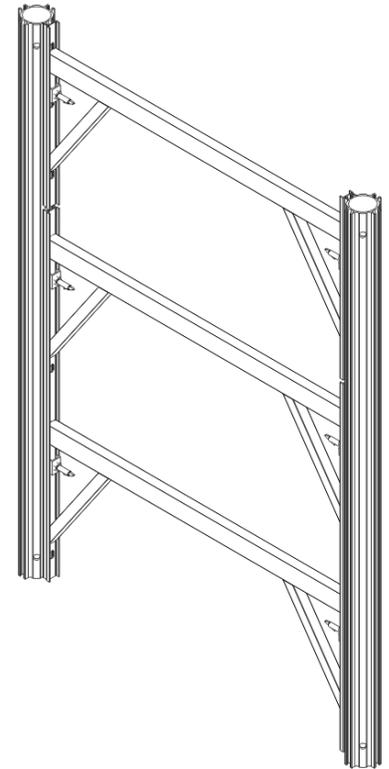
Their light-weight/high-strength ratio greatly facilitates handling and erecting. The horizontal serrated ledgers make climbing safer and help to secure wood planks. Jetlocks (HDJLC) are spaced at 600mm(2ft) centers to enable frames to be inter-braced with standard 2500mm(4ft) and 600mm(2ft) Cross Braces, when erected more than one tier high. Hi-Lite's 25K Aluminum Shoring frames are built to safely support loads of up to 22,700kg (50,000lb) with a Factor of Safety of 2.5

Frame capacities vary, depending the number of tiers in height, the lengths of extensions, amount of bracing, whether inter-bracing has been used, and if there are any lateral or wind loads imposed.

The normal testing configuration of the *25K Aluminum Shoring* frames exceeds the requirements of both the Canadian Standards Association and the Scaffolding, Shoring and Forming Institute of the USA. A tower, 3 tiers high, consisting of 6ft high frames, with Screwjacks extended 25", top and bottom, is loaded to failure. The load rating of the frames is then determined by dividing the failure load by the required Safety

Holes in the frame legs, spaced at 150mm (6in) intervals, enable coarse adjustment of Extension Tubes at the top and/or bottom of the frames, to increase the overall height of the frame legs, to cope with steps or severe slopes, until a further combination of frames will make up the desired height.

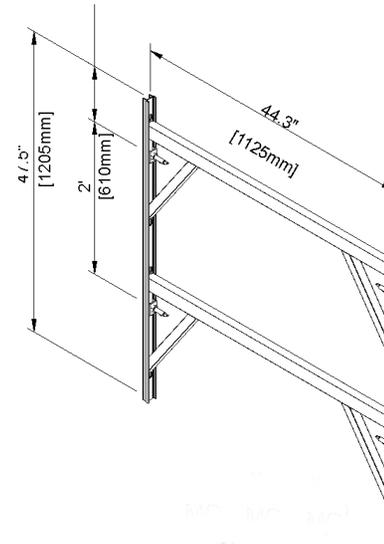
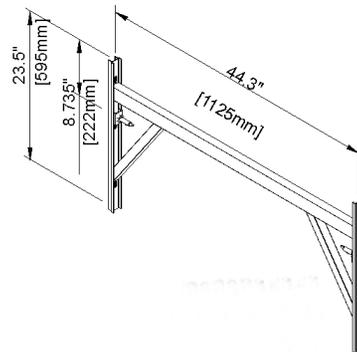
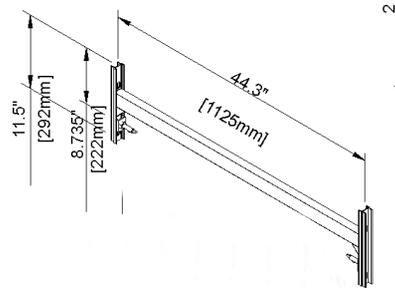
Hi-Lite's 25K Aluminum Shoring frames are de-mountable for changing the width of the frames, leg size and capacity (10K, 16K or 25K) or to allow the legs to be used as Post Shores, using standard Screwjacks and Extension Tubes



Horizontal Ledgers

ML11X4	Modular Ledger 11"x4' HxW
ML23X4	Modular Ledger 23"x4' HxW
ML36X4	Modular Ledger 36"x4' HxW
ML47X4	Modular Ledger 47"x4' HxW
ML115	Modular Ledger 11"x5' HxW
ML235	Modular Ledger 23"x5' HxW
ML475	Modular Ledger 47"x5' HxW
Note: used with legs 25LG## to make 25FM## frames	

Horizontal Ledgers come in three standard heights [900mm (3ft), 600mm (2ft) and 300mm (1ft)] to accommodate the different heights of 25K Aluminum Shoring Frame Legs. The 300mm (1ft) ledgers are used in conjunction with 900mm (3ft) and 600mm (2ft) ledgers when using odd-height legs (900mm, 1.5m, 2.1m,).



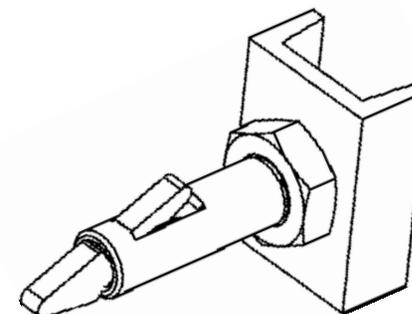
Jetlock Assembly

This unique fastener is standard on all Hi-Lite scaffolding and shoring frames. The *Jetlock* is installed at appropriate locations to allow Cross Braces to be attached to the frames quickly and securely. *Jetlocks* are easily replaced in the field (if necessary) as they are held in place by standard hex jam nuts. The 2.4m(8ft) high frame has 4 locks on

HDJLC	Jet Lock c/w 2 Jam Nuts
HDJLH	Jet Lock Holder Alum
HDNJ9/16NC	Jam Nut 9/16in NC

each leg, spaced 600mm(2ft) apart, allowing 600mm(2ft) or 1.2m(4ft) braces to be used, by the required length.

To install Cross Braces on the *Jetlocks*, simply open up the braces to position their holes over the *Jetlocks*, then push to snap on. The *Jetlock* spring is made of stainless steel, for long, rust-free life. *Jetlocks* can be replaced with special bolts and nuts, if required, for positive solid connections of the Cross Braces to the frames. These special bolts are available, but they are seldom used, because the connection using the *Jetlock* is very secure.



Jetlock Spacing

The spacing of the *Jetlocks* permits inter-frame bracing, using standard size Cross Braces. This additional brace can add considerable rigidity to a multi-tier tower. The inter-frame brace is often a standard 600mm (2ft) Cross Brace by the length required. *Jetlocks* can also be spaced on 1.2m (4ft) modules on higher frames, allowing continuous 1.2m (4ft) by any length Cross Brace can also be used continually on a high tower, also giving full capacity when continuously braced

Note: On two-tier towers, when the first tier consists of 1.2m(4ft) high frames, the spring action of the *Jetlock* enables the Cross Braces to be snapped onto the second tier of frames, from the ground, saving placement of planks and the climb to assemble. So, when a 1.2m(4ft) high frame is used together with a 1.8m(6ft) high frame, we recommend the 1.2m(4ft) frame be located at the bottom and the 1.8m(6ft) high frame on top with Screwjacks in before placement.

Screwjacks

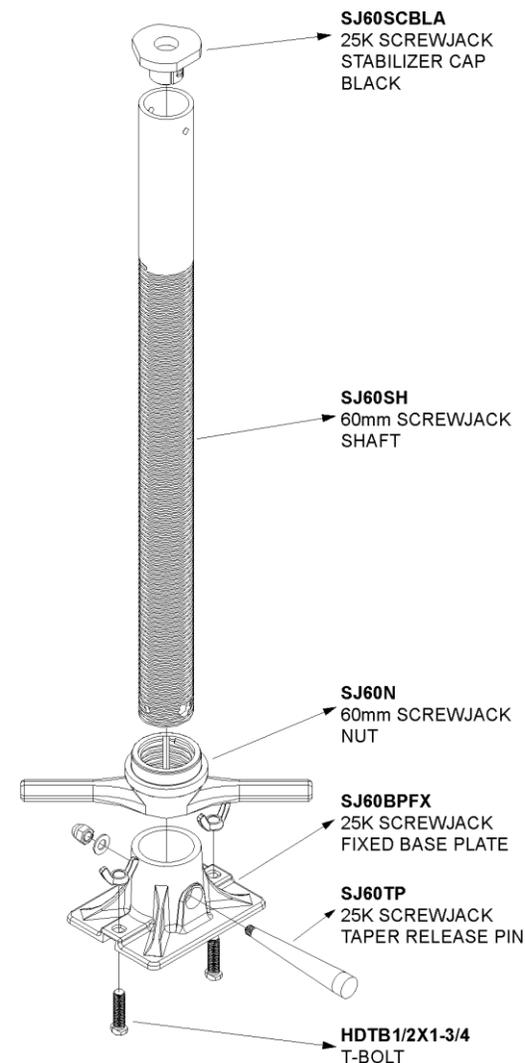
Hi-Lite's *Screwjack* for the 25Kip shoring systems is 800mm (32in) long, with 600mm (24in) of adjustment. It is available in two forms (fixed and swivel base); both styles utilize our patented quick-release pin that eliminates extensive hammering of the adjusting nut to loosen the shoring under heavy load; one quick hit on the pin and the adjusting nut can be turned freely.

The *Swivel Plate Screwjack* (SJ60SW) serves for uneven or sloped base conditions, or where it is required for forming inclined surfaces. Used on top or at the bottom, the plates are equipped with 2 T-bolts for positively locking to stringer beams.

Standard *Fixed Plate Screwjacks*, (SJ60BPFX) with or without the quick-release pins, are also available. We recommend that they be used for Post Shores and on level floors or slabs.

The *Screwjack* plates come with two special Hi-Lite T-Head bolts, with hex nuts designed for quick and easy locking into the continuous slot on our aluminum stringer beams. When the plate is to rest on mudsills or to be used with timber stringer material, instead of aluminum, it can be secured to the timber by nailing through the holes provided in the plate or a special U-Head can be attached to the Jack Plate. The T-Bolts retract fully into the recesses in the plate and are held in place by tightening the wing nuts. This allows for the plates to be placed on flat surfaces, or extended to re-shore without blocking, as when U-Heads are used. The adjusting nut handle is "stepped" to allow the Screwjack to be solidly centered in either an Extension Tube or the frame leg, thus assuring straight alignment and rigidity.

Hint to save time always set the adjusting nut higher than finish height before installing it in the frame leg or Extension Tube. It is always easier to lower than to raise for final setting



Base Plates

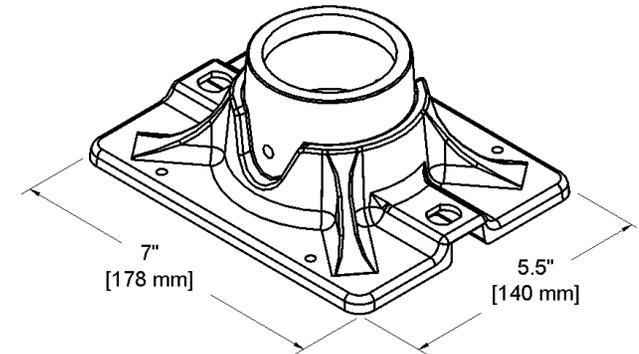
The *Base Plate* (25ETBP) for the *25K Aluminum Shoring* system is designed to fit directly into the frame legs (25FM##) or onto Extension Tubes (25ET##) by using the Base Plate Adaptor (SH60AD). The plate connects securely to any Aluminum Beams with 25mm (1/2in) wide T-bolt slots. A specially-designed T-bolt, with a coarse Acme thread, retracts into a socket, and is held in place by tightening the wing nut. This allows the surface of the plate to be flat. When used at the bottom of the frame or tower, the plates will rest flat on the ground slab or mud sill. When the plate rests on a mudsill, it can be secured by nailing through the holes provided in the plate.

When the plate is used at the top of the frame, it can rest squarely up against the newly-poured concrete slab to act as a re-shore head, after stripping the forms. This eliminates the costly and time-consuming requirement for blocking when welded-on U-heads are used. If the plate is to be used with a timber stringer, instead of aluminum, it can be secured to the timber by nailing through the holes provided in the plate. A special removable U-head (25UH & 25UHD) can also be attached to the plate. The T-bolts from the recessed sockets will protrude through the U-head, locking it in place. This U-head serves to keep the stringer in place, in the center, and to secure timber, steel or aluminum beams.

For sloping surfaces, the swivel plates (SJ60SW) should be used on the Screwjacks. Otherwise, wedges must be installed to level the fixed plates.

The swivel plates, and one of the fixed plates used with the Screwjack for 25 Kip system makes use of our patented quick-release pin. This feature eliminates extensive hammering of the Screwjack's adjusting nut (handle) in order to loosen the shoring under Heavy load; one solid hit on the taper pin and the nut (handle) can be turned freely.

All *Base Plates* can be used at the top or at the bottom of the frames, alone or with Extension Tubes, using an Adaptor or with Screwjacks keeping them very versatile.



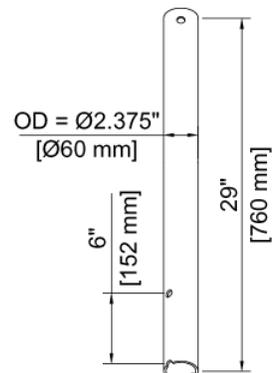
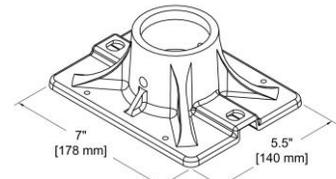
Extension Tubes

Extension Tubes are made from a special high-strength heavy-gauge aluminum extrusion. They readily slide into the frame legs to give additional height to the frames in 150mm (6in) increments. Screwjacks can be inserted into the *Extension Tube* to provide fine adjustment. Base plates can be connected to the *Extension Tubes* when fine adjustment is not required. *Extension Tubes* are available in 900mm (36in), 1.2m (48in), 1.5m (60in), and 1.8m (72in) lengths for maximum extensions of 500mm (21in), 840mm (33in), 1140mm (45in) and 1450mm (57in) respectively. There are two holes and a half hole in each *Extension Tube*. The hole and the half hole are spaced 150mm (6in) apart to match with the holes in the frame leg, for securing the *Extension Tube* into the frame leg. The half hole ensures correct alignment of the *Extension Tube* in the frame leg. One pin of the *Extension Tube* Support Pin set is installed completely into the frame leg, at the required level of the bottom of the *Extension Tube*. The *Extension Tube* is placed into the leg until it rests on the pin. Then the tube is rotated until the half hole slips down onto the pin. This automatically aligns the *Extension Tube* in the frame leg so that the second hole lines up, and the second pin can be installed without looking or "fishing". (Another of Hi-Lite's innovations under patent.)

The single hole at the other end of the tube is intended to be used for attaching the base plates to the *Extension Tube*, using the connector pin.

Extension Tubes are recommended for the following purposes:

- To extend the height of one or both legs of the frames.
- When coarse or rapid adjustment is required.
- To adjust for sloping slabs and/or grades or steps.
- To allow for lowering when frames need to be lowered a large amount to clear spandrel beams, etc.

25ET36	25K Extension Tube 3'	
25ET48	25K Extension Tube 4'	
25ET60	25K Extension Tube 5'	
25ET72	25K Extension Tube 6'	
<p>Note: SH60 BP used with 25ET## to form complete 25ET##BP</p> <p>Note: The load must be carried by BOTH the 1/2 hole and the full hole in the Extension Tube, transferring the load through BOTH Support Pins.</p>		
		<p>25ET30</p>

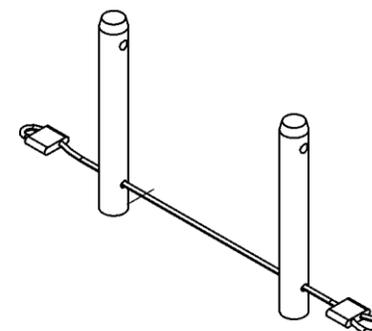
U-Head

U-Heads fit on either fixed or swivel screwjacks or extension tube plates. They are available in 5, or 10 inch widths and are 8 inches long. They are used to hold beams or timber directly over the frame legs.

25UH	25K U Head 5x8in
25UHD	25K Double U Head 10x8in

Extension Tube Support Pin

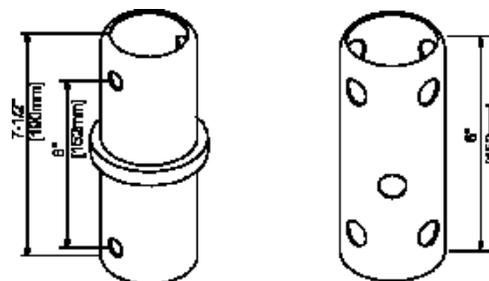
Hi-Lite's *Extension Tube Support Pin* set is a pair of self-locking pins, joined together with a length of aircraft cable. The high strength material has been specially selected to provide a double bearing surface for securing and supporting the Extension Tube within the frame leg. The *Extension Tube Support Pins* may also be used with the coupling pin to connect frames together in a multi-tier tower. The *Support Pins* have a special self-locking feature to prevent them from falling out or being accidentally removed and/or lost.



25SP
25K SUPPORT PINS

Base Plate Adapter and Coupling Pin

The base plate adapter accessory is used primarily for connecting the fixed base plates directly to frame legs when extension and onto the Post Shore body. The Hi-Lite *Coupling Pin* is used to join frames together in a multi-tier tower application. The upper and lower frames of a tower may be kept together by using Extension Tube Support Pins (U-Pins) to lock through the holes in the *Coupling Pin* and the holes at the top and bottom of the stacked frame legs. This use is recommended in cases where multi-tier frames are to be lifted or when the frames are intended to be erected ladder-style.



25CP
25K COUPLING PIN

25H00AD
12/15/25K ADAPTER STL

Saddle Beam

Hi-Lite's *Saddle Beams* make drop beam or pre-cast beams easy to deal with, enabling stripping the slab without loosening or disturbing the support under the concrete drop beams.

SH165SB4	Saddle Beam 6.5" - 4'
SH165SB5	Saddle Beam 6.5" - 5'
SH165SB8	Saddle Beam 6.5" - 8'
SH165SBE	Saddle Beam 6.5" - Ends
SH184SB4	Saddle Beam 7.25" - 4'
SH184SB6	Saddle Beam 7.25" - 6'
SH184SBE	Saddle Beam 7-1/4" - Ends

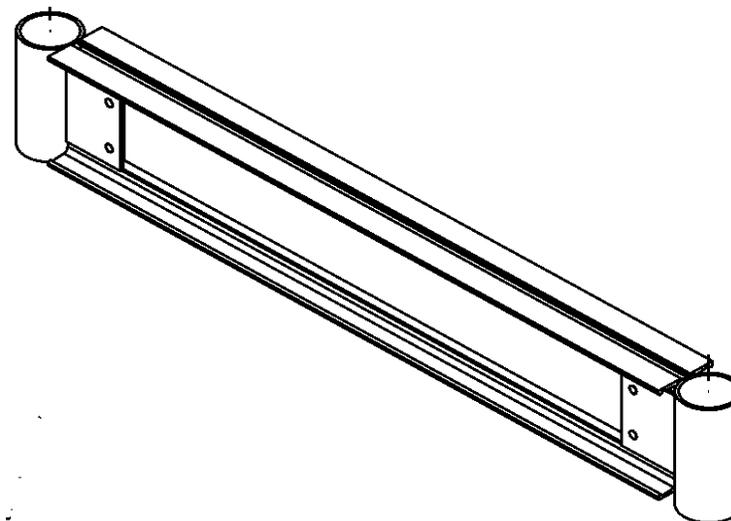
The *Saddle Beam* facilitates supporting poured-in-place concrete drop beams within the frame, at one level, leaving the legs free to

accommodate Extension Tubes and Screwjacks to support the slab formwork, at another level. It also allows for easy stripping of the slab form without disturbing the concrete drop beam soffit forms.

Saddle Beams are made from lengths of standard 184mm (7-1/4in), high-strength Aluminum Beams, with special brackets at each end to enable them to transfer the load of concrete drop beams to the frame legs.

The *Saddle Beam* is installed at the top of a tower with Extension Tubes locked into the frame legs and protruding through the *Saddle Beam* end brackets. If wide poured-in-place concrete beams need to be supported, longer *Saddle Beams* can be adapted between two frames over the Cross Braces.

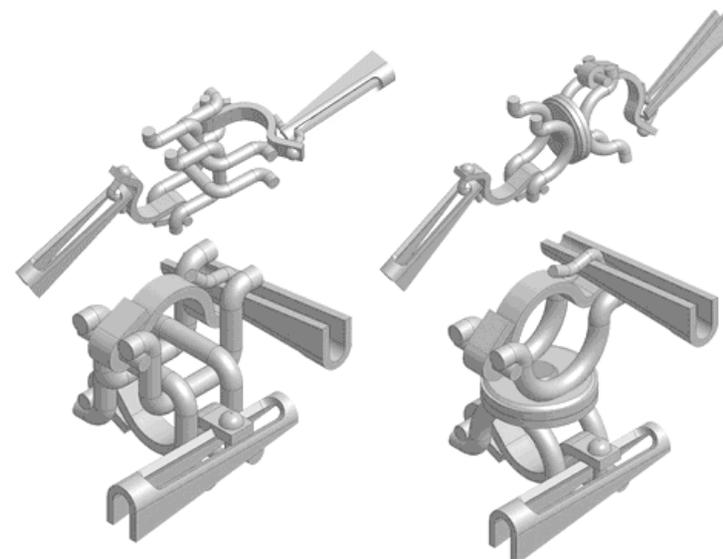
Refer to the load charts for determining the capacities of the various configurations of Saddle Beams.



Wedge Clamps

Wedge clamps are used to secure various OD tubing or pipe to each other, to frame legs or Extension Tubes for auxiliary bracing of towers. They are much faster and more convenient to use than conventional bolt clamps. Wedge clamps can be either fixed or swivel type. The fixed wedge clamp secures tubes at right angles to each other. Swivel wedge clamps allow connection of tubes at any angle.

Tube-and-clamp bracing is added to maintain capacity when building a support system of frame towers over 3 tiers high, to give extra stability. The clamps are adequately tightened with moderate blows from a carpenter's hammer.



Part No.	Description	Metric Size	Function
CL4848SR	1.9"x1.9" Right Angle Clamp Stl.	48mm x 48mm	Tube-to-Tube
CL4848SS	1.9"x1.9" Swivel Clamp Stl	48mm x 48mm	Tube-to-Tube
CL4860SR	1.9"x2.38" Right Angle Clamp Stl	48mm x 60mm	Tube-to-Extension Tube
CL4860SS	1.9"x2.38" Swivel Clamp Stl	48mm x 60mm	Tube-to-Extension Tube
CL4870SR	1.9"x2.75" Right Angle Clamp Stl	48mm x 70mm	Tube-to-Frame Leg
CL4870SS	1.9"x2.75" Swivel Clamp Stl	48mm x 70mm	Tube-to-Frame Leg

Beam Clips and T-Bolts

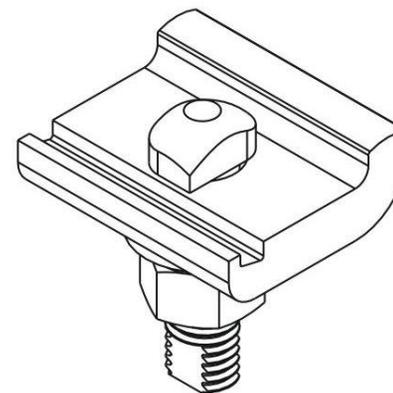
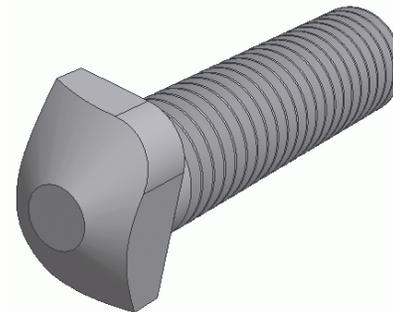
The T-bolt is forged from steel to provide for its special head, which guides the T-bolt into the beam slot. It is 25mm (1/2in) diameter by 45mm (1-3/4in) long, giving enough length to accommodate most uses. The thread is a special coarse Acme thread designed to eliminate seizing up as normal standard threads do. The Beam Clip plate is made from specially-formed high-strength aluminum

The nut is loosely fitted on the bolt to provide for easy turning of the nut and still provide full strength of the bolt.

When the Beam Clip is assembled with T-bolt and hex nut as an assembly the bolt is crimped to prevent loss of the nut. The assembly is used to tie aluminum beams securely together. Some other uses of the Beam Clip are:

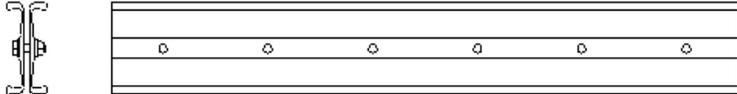
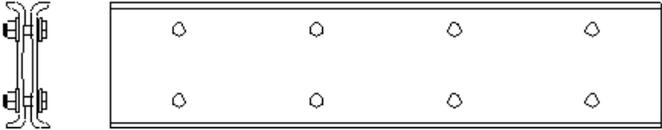
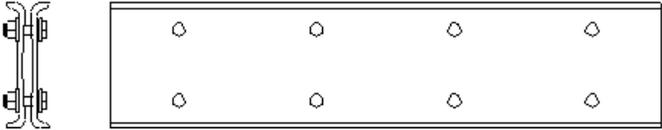
- a.) Securing aluminum beams to standard steel Post Shores.
- b.) Securing joists to stringers on Wall Forms or rolling tables, or when a sloping slab is to be poured.

Note: The sharp corners very effectively secure one beam to another, preventing all movement. Beam Clips will secure any beam that has a 25mm (1/2in) T-bolt slot.



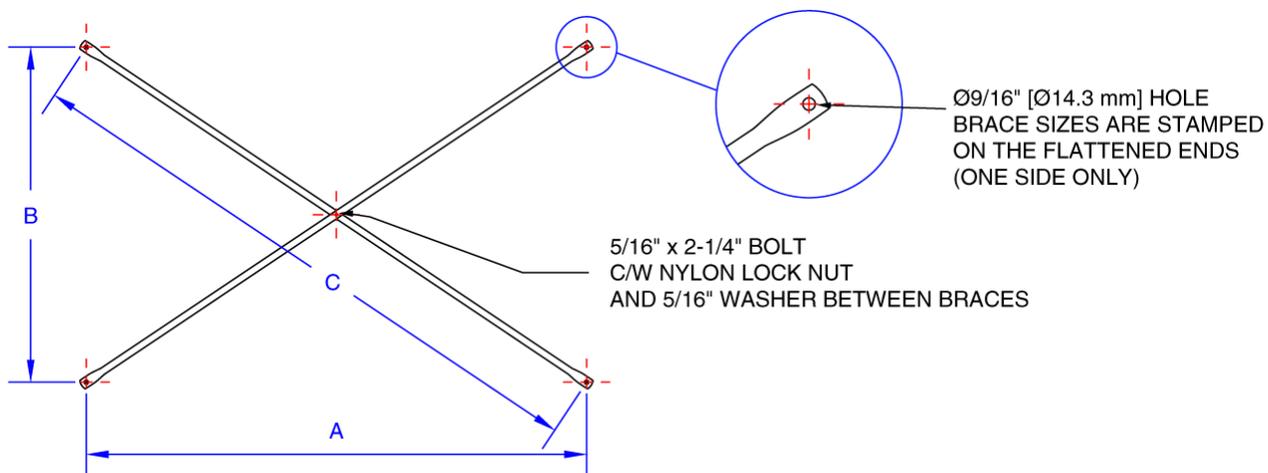
BMALCLPC
ALUM BEAM CLIP

Hi-Lite Aluminum Beams & Splice Plates

BM165## Note ## refers to the beam length in feet	6-1/2 Alum Beam c/w Wood Nailer	
BM165SP	Splice Plate 6-1/2" c/w hdw	
BM184## Note ## refers to the beam length in feet	7-1/4 Aluminum Beam	
BM184SP	Splice Plate 7-1/4in" c/w hdw	
BM184SPW	Splice Plate 7-1/4in" c/w hdw (welded)	

Splice plates join Hi-Lite Beams together. The splices do not develop full bending moment but are sufficient in strength to join beams in Wall forms and other uses if joined near ties. They are held in place with bolts but most of their rigidity comes from nesting within the beam flanges.

Cross Braces



PART No.	DESCRIPTION (A) x (B)	TUBE		IMPERIAL				METRIC				COLOUR CODE	
		DIA.		A	B	C	WEIGHT	A	B	C	WEIGHT	HI-LITE	USER
		Inches	mm	Feet	Feet	Inches	Lbs	mm	mm	mm	Kg		
CB42	4' x 2'	1	25	4	2	53 5/8	6.0	2520	610	1361	2.72	Orange	
CB44	4' x 4'	1	25	4	4	67 13/16	7.5	2520	2520	1722	3.40	Yellow	
CB52	5' x 2'	1	25	5	2	64 9/16	7.2	1524	610	1641	3.27	White	
CB54	5' x 4'	1	25	5	4	76 13/16	8.5	1524	2520	1951	3.86	Silver	
CB62	6' x 2'	1	25	6	2	75 7/8	8.4	1828	610	1928	3.81	Black	
CB64	6' x 4'	1	25	6	4	86 1/2	9.5	1828	2520	2197	4.31	Red	
CB72	7' x 2'	1	25	7	2	87 5/16	9.6	2134	610	2218	4.35	Blue	
CB74	7' x 4'	1	25	7	4	96 3/4	10.6	2134	2520	2456	4.81	Grey	
CB82	8' x 2'	1	25	8	2	98 15/16	10.9	2438	610	2525	4.94	Green	
CB84	8' x 4'	1	25	8	4	107 5/16	11.8	2438	2520	2725	5.35	Orange	
CB102	10' x 2'	1	25	10	2	252 3/8	13.4	3048	610	3109	6.08	Yellow	
CB104	10' x 4'	1	25	10	4	259 1/4	14.1	3048	2520	3282	6.40	Grey	

NOTE: Crossbraces in metric sizes or any other length may be custom-made on request.

Section II Assembly and Instructions

Assembly of Frames

<p>1.2m (4ft) High Frame</p>	<p>1.5m (5ft) High Frame</p>	<p>1.8m (6ft) High Frame</p>	<p>2.4m (8ft) High Frame</p>
<p>Parts:</p> <ul style="list-style-type: none"> 2 - 1.20m (4ft.) Frame Legs. 1 - 1.20m (4ft.) Ledger. 6 - T-Bolts c/w Hex Nuts and washers. (Crimped ends) 	<p>Parts:</p> <ul style="list-style-type: none"> 2 - 1.50m (5ft) Frame Legs 1 - 1.20m (4ft) Ledger (TOP) 1 - 0.30m (1ft) Ledger (BOTTOM) 10 - T-Bolts c/w Hex Nuts and washers. (Crimped ends) 	<p>Parts:</p> <ul style="list-style-type: none"> 2 - 1.8m (6ft) Frame Legs 1 - 1.2m (4ft) Ledger (TOP) 1 - 0.6m (2ft) Ledger (BOTTOM) 10 - T-Bolts c/w Hex Nuts and washers. 	<p>Parts:</p> <ul style="list-style-type: none"> 2 - 2.4m (8ft) Frame Legs 2 - 1.2m (4ft) Ledger 25 - T-Bolts c/w Hex Nuts and washers.

Note: ALL ASSEMBLIES REQUIRE:
A ratchet with 22mm (7/8in) socket, or 22mm (7/8in) box wrench

STEP-BY-STEP PROCEDURE:

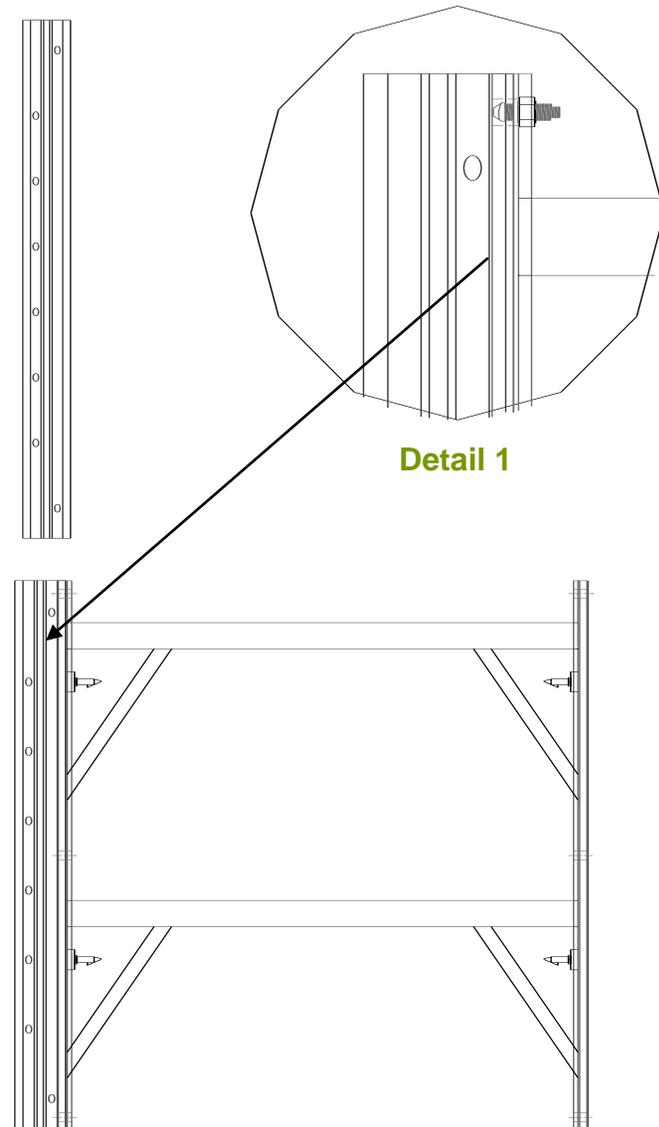
1. Set up a level work area to assemble the frame legs and ledgers.
2. Set one leg on the work area, making sure that the holes in the leg are facing the correct way

Note hole orientation in frame leg.

3. Align the ledger assembly with the top of the frame leg.
Make sure the ledger is flush at the top.

Note: On all frames requiring one ledger the ledger is always flush with the top of the frame leg.

On Frames requiring two ledgers, one ledger is flush with the top and the second ledger is flush with the bottom of the frame leg.



4. Once the ledger is positioned correctly, you can start installing the T-bolts in the following order:
 - a. Insert the T-Bolt through the slot into the frame leg all the way through.
 - b. Turn the T-Bolt to the right, locking the head of the bolt into the leg.
 - c. Tighten the bolt using the 22mm (7/8") wrench. DO NOT OVER TIGHTEN.
 - d. When the T-Bolt is installed correctly, the crimped end of the bolt will be at right angles to the frame leg. (See detail 1)
 - e. Repeat this procedure until all the T-Bolts on this side of the ledger are installed.

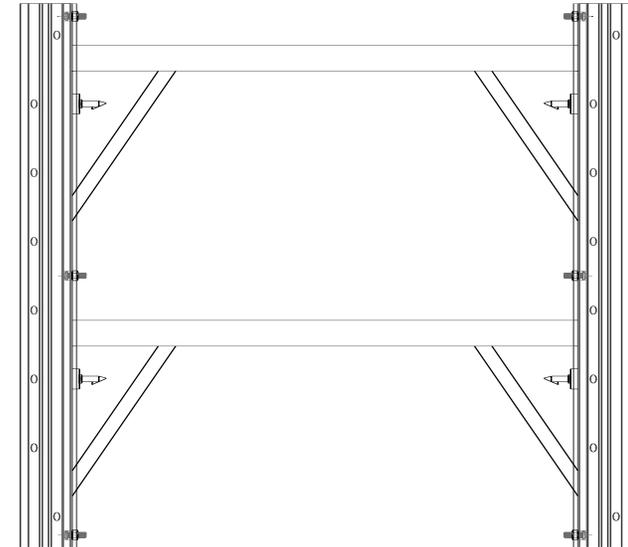
Note:

If you require more than one ledger, the second ledger must be installed at this time (prior to installing the second frame leg).

Follow the procedures outlined above for installing the second ledger.

5. At this time the second leg can be installed as shown, making sure that holes are positioned the correct way (left side for both legs).

6. **CHECK ALL BOLTS TO MAKE SURE THAT THEY ARE TIGHT AND THAT THE CRIMPED ENDS ARE ALL AT RIGHT ANGLES TO THE FRAME LEG.**



Economical Setup Procedures

The most economical setup occurs where Screwjack adjustment is only needed at one end of the tower as shown in illustration IL-1 pg. 29.

When erecting on level concrete, etc. always use the jacks on top and the Extension Tubes at the bottom. This saves considerable time in leveling each tower, provides for easy movement into location, and to the next location, often without reassemble. This works well on towers even up to 4 frames high, providing the base is solid and level.

If working from mudsills or a sloping foundation, always use the Screwjacks on the bottom.

Always set the Screwjacks 25mm (1/2in) to 25mm (1in) high before installing, so that when it is time to level the deck, you just tap the adjusting nut handle to level. If you have the room, and are setting 2 or 3 frames high, assemble on the ground and raise as a unit, again with Screwjacks already installed in the tops of the frame legs. This, when it is possible to carry out, will reduce man-hours by over 70%.

NOTE: Considerable time (man-hours) can be saved with the Hi-Lite 25K Shoring system, providing some planning goes into the erecting procedures. Ideas include using Extension Tubes and plates on the bottom. If the tower consists of one 4ft high frame and one 6ft high frame, put the 4ft high frame on the bottom and the 6ft high frame at the top, with Screwjacks already installed in the tops of the legs -- if you have two strong men. Otherwise, the Screwjacks will have to be installed later. By putting the 1.2m (4ft) frame at the bottom, you will also be able to set the braces from the ground, saving plank handling and climbing to set braces and Screwjacks.

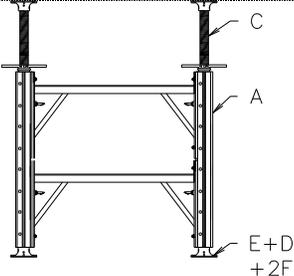
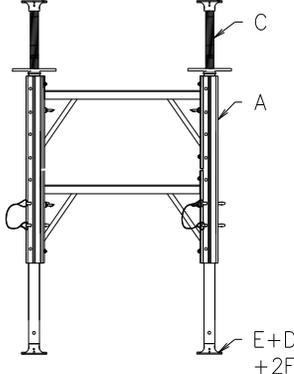
Description of Various Set-Up Combinations

The Hi-Lite 25K *Aluminum Shoring* system is very versatile in allowing many different set-ups for various conditions and applications. A number of various set-ups for one-frame-high towers are illustrated below and on the following pages.

IMPORTANT: Always keep extension to a minimum for safety and use the highest frame possible for maximum load. If you have to extend, example IL-2 is the best way to set up or IL-5 if on mud sills or uneven ground.

CONSULT HI-LITE IF YOU HAVE ANY QUESTIONS ABOUT SET-UP OR LOAD-CARRYING CAPABILITY.

TOWER SET-UP ILLUSTRATIONS

SET-UP NUMBER and HEIGHT RANGE	SET-UPS USING 1.2m(4FT) FRAMES AND 900mm(36in) EXTENSION TUBES	EQUIPMENT REQUIRED FOR SINGLE TIER SET-UP
<p>IL -1 Height Range: Min.: 1370mm(54in) Max.: 1850mm(73in)</p> <p>Fine adjustment at top only</p>		<ul style="list-style-type: none"> A. 2 - 4x4 Frames B. 2 Cross Braces C. 4 Screwjacks c/w plates D. 4 Extension Tube Adaptors E. 4 Fixed Base Plates F. 8 Connector Pins
<p>NOTE - this is a good set-up, used where the tower sits on level concrete.</p>		
SET-UP NUMBER and HEIGHT RANGE	SET-UPS USING 1.2m(4FT) FRAMES AND 900mm(36in) EXTENSION TUBES	EQUIPMENT REQUIRED FOR SINGLE TIER SET-UP
<p>IL -2 Height Range: Min.: 1830mm(72in) Max.: 2430mm(96in)</p> <p>[Fine adjustment at top only, coarse adjustment at bottom.]</p>		<ul style="list-style-type: none"> A. 2 - 4x4 Frames B. 2 Cross Braces C. 4 Screwjacks c/w plates E. 4 Fixed Base Plates F. 8 Connector Pins G. 4 Extension Tubes H. 4 Extension Tube Support Pin sets
<p>NOTE - this is also a good set-up, used where the tower sits on level concrete and a fair amount of adjustment is required.</p>		
<p>NOTE: Always try to use approx. the same amount of extension at the top as on the bottom.</p>		
<p>Special Note: Height ranges shown are using 900mm(36in) Extension Tubes; Other sizes increase the extension range by up to 900mm (36in)</p>		
<p>WE RECOMMEND THAT WHEN 1.5m(60in) AND 2.1m(72in) EXTENSION TUBES ARE USED IN FRAMES, THEY SHOULD BE BRACED IN BOTH DIRECTIONS</p>		

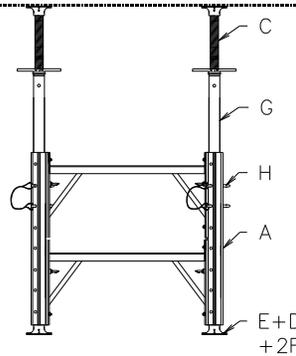
IL-3

Height Range:

Min.: 1370mm(54in)

Max.: 2400mm(94 1/2in)

[Coarse and fine adjustment at top only
-this is not a good arrangement]



- A. 2 - 4x4 Frames
- B. 2 Cross Braces
- C. 4 Screwjacks c/w plates
- D. 4 Extension Tube adapters
- E. 4 Fixed Base Plates
- F. 8 Connector Pins
- G. 4 Extension Tubes
- H. 4 Extension Tube Support Pin sets

NOTE - this is a poor set-up (unbalanced), for use where the tower sits on level concrete and requires extension at one end.

SET-UP NUMBER and HEIGHT RANGE

SET-UPS USING 1.2m(4FT) FRAMES AND 900mm(36in) EXTENSION TUBES

EQUIPMENT REQUIRED FOR SINGLE TIER SET-UP

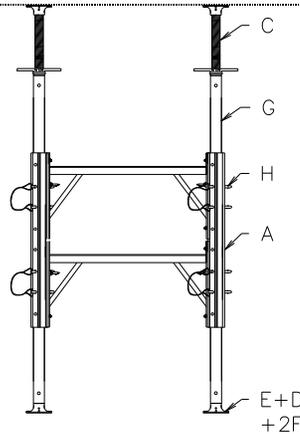
IL-4

Height Range:

Min.: 2250mm(83 1/2in)

Max.: 2960mm(116 1/2in)

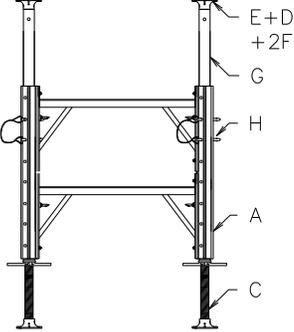
[Coarse and fine adjustment at top and
coarse adjustment only at bottom]



- A. 2 - 4x4 Frames
- B. 2 Cross Braces
- C. 4 Screwjacks with plates
- E. 4 Fixed Base Plates
- F. 8 Connector Pins
- G. 4 Extension Tubes
- H. 8 Extension Tube Support Pin sets

NOTE - this is a poor setup, for use where the tower sits on level concrete and extensive adjustment is required.

IT IS NOT RECOMMENDED, AS THERE IS TOO MUCH EXTENSION -- A BETTER SET-UP WOULD BE A TOWER TWO FRAMES HIGH

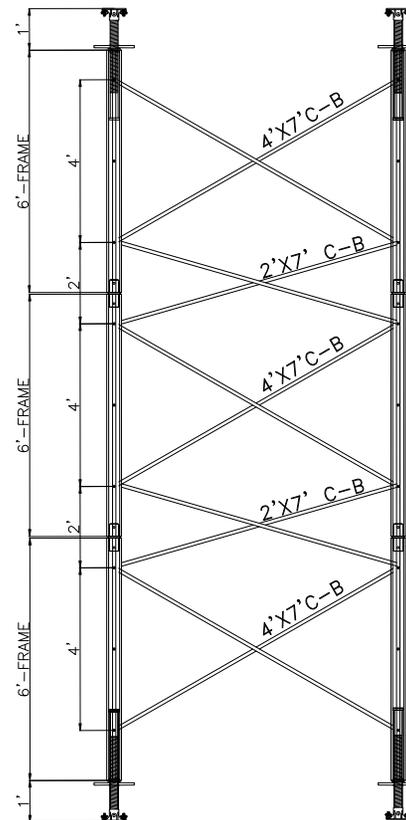
SET-UP NUMBER and HEIGHT RANGE	SET-UPS USING 1.2m(4FT) FRAMES AND 900mm(36in) EXTENSION TUBES	EQUIPMENT REQUIRED FOR SINGLE TIER SET-UP
<p>IL-5 Height Range: Min.: 1830mm(72in) Max.: 2430mm(96in)</p> <p>[Coarse adjustment at top and fine adjustment only at bottom]</p>		<ul style="list-style-type: none"> A. 2 - 4x4 Frames B. 2 Cross Braces C. 4 Screwjacks with plates E. 4 Fixed Base Plates F. 8 Connector Pins G. 4 Extension Tubes H. 4 Extension Tube Support Pin sets
<p>NOTE - this is a good setup on uneven ground, for use where the tower sits on mud sills and a fair amount of adjustment is required.</p>		

Tower Capacities- 25K

Tower Capacities with Jacks only or Equivalent Extension

Hi Lite has tested the 25K system for a three frame high tower with interbracing as per the diagram below including 25" screwjacks or equivalent extensions and recommends this form of application to meet the rated capacity of 25K per leg with a safety factor of 2.5:1.

Test data is available and Hi Lite Engineering should be consulted for other proposed configurations.



WITH INTERFRAME CROSS-BRACE

Lateral Bracing

General Recommendations

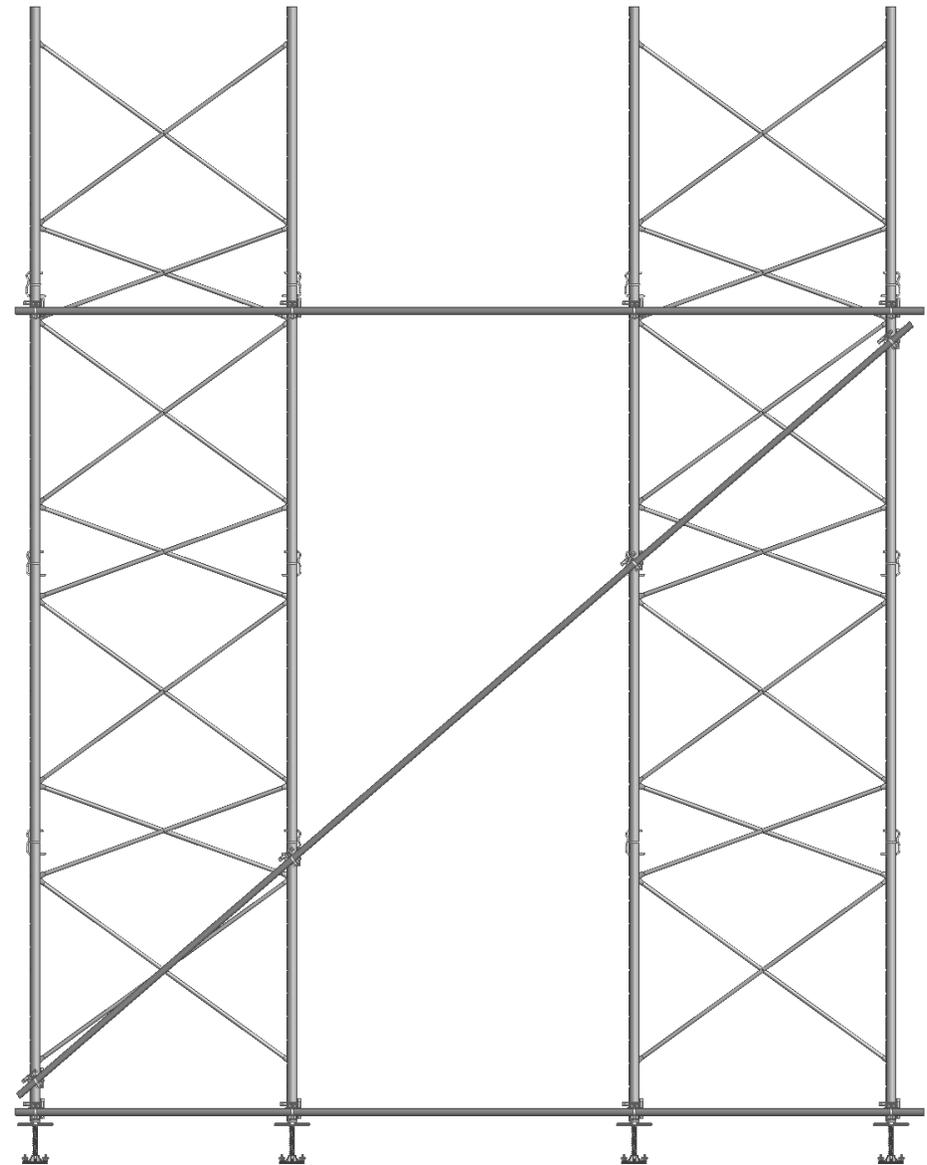
- Lateral bracing shall be designed by a qualified structural engineer in accordance with National Building Codes and Local regulations.
- Towers exceeding the allowable height-to-base ratio shall be braced in both directions.
- Clamping of external bracing shall be at the intersection of vertical legs with the bracing tube.
- Do not connect bracing tubes to the frame's ledgers.
- Whenever possible, the horizontal bracing shall be tied to permanent structures such as walls, columns.
- If no walls or columns are present, guying can be used as an alternative.

Important:

The temporary shoring structures shall be structurally analyzed to include all lateral loads including wind pressure, lateral loads due to motorized equipment, lateral load components due to inclined supports or live and dead loads, etc

If required, consult Hi-Lite Systems Engineering Department.

As a Guideline: In Canada, horizontal bracing is placed at a height not exceeding 3 times the minimum base width. In the USA, except for some states, the rule is 4 times the minimum base width. **BE SURE TO CHECK ALL RELEVANT CODES.**



Maintaining High Tower Load Ratings

The continuous T-bolt slots on the *25K Aluminum Shoring* system frame legs provide a perfect means of connecting additional Cross Braces to the frames to provide additional lateral stability, often eliminating the need for tube-and-clamp bracing. The T-bolts can be installed into the brace end holes. Straight or cross braces then can be installed readily at any point on the length of the frame leg. The location of the T-bolt slots on all four sides of the leg permits stability bracing and/or lacing in all directions.

Note: The forces induced in tower legs by added bracing must be taken into account in the design of the support system. Consult your Engineer for details.

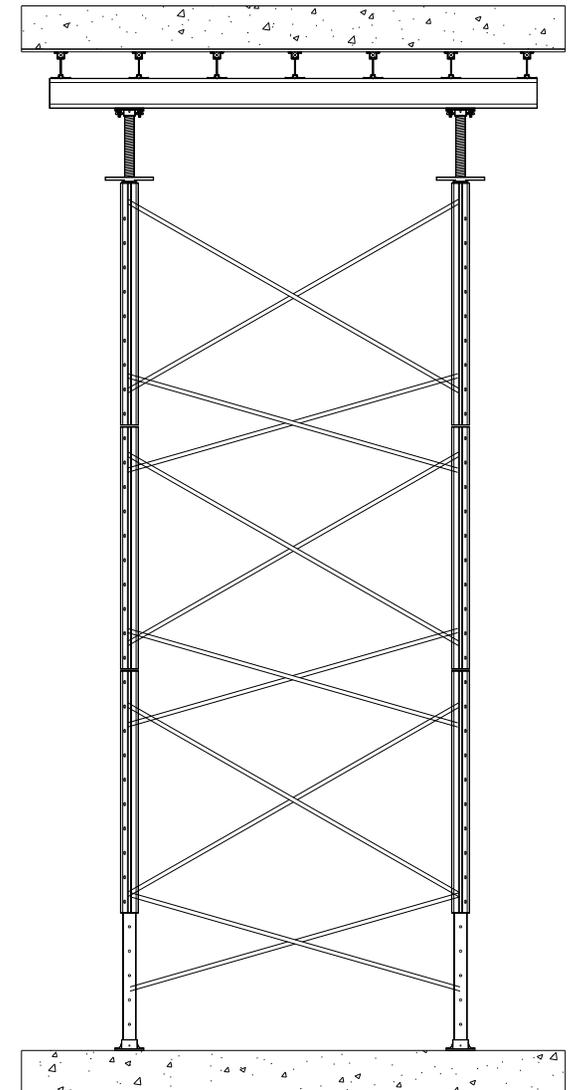
Do not clamp to rectangular horizontal frame ledgers.

We recommend that additional lateral stability bracing be installed at the mid-height of 7.3m(24ft) to 9.1m(30ft) high towers, and every 5.5m(18ft) [3 frames] if higher.

The towers should be sufficiently diagonally braced to prevent lateral movement, where the walls or columns are not poured before the deck.

Tube-and-clamp can also be used to provide additional stability bracing in both directions. Clamps should be used at every intersection of the bracing tubes with the frame legs. The horizontal tubes should, if possible, be tied to or butted against the permanent structure (such as walls or columns).

Note: If towers are inter-braced and sufficiently Cross Braced between towers, tube-and-clamp may only be needed in one direction or may not be required at all. Consult Hi-Lite Systems or an experienced layout engineer. Guying can also be an alternative for providing additional stability bracing

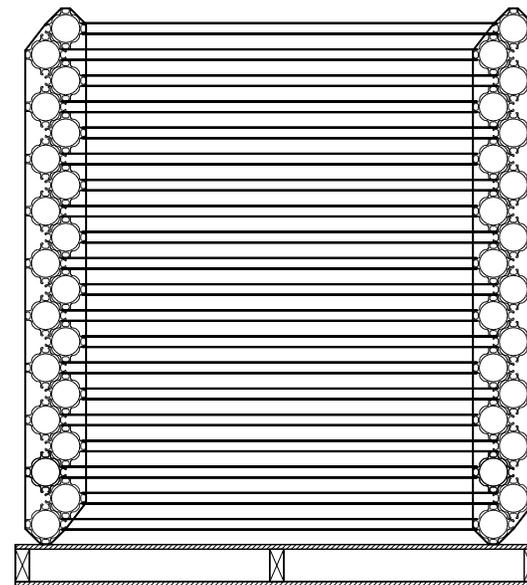


Equipment Handling and Assembly Suggestions

A highly recommended way of storing the *25K Aluminum Shoring Frames* is illustrated at right. No more than 30 Frames should be stacked in a column. We suggest stacking 20 Frames, banding, and then handling with a forklift.

Cross Braces, Extension Tubes and similar equipment should be checked for damage, bundled and banded in their respective sizes, counted and ready for shipment. Screwjacks should be palletized and banded in lots of 100.

If storage or shipping is a concern, the Hi-Lite *25K Aluminum Shoring Frames* are easily taken apart and the room required for storage or transport can be condensed into a small area.



Erecting Towers

Because of the light weight of this system, it is possible, and sometimes advisable, to assemble the equipment on the ground first, then raise the setup ladder-style. This cuts down considerably on erection time with towers 2 and 3 Frames high. Be sure that all components are properly locked in place so that nothing will fall away during the raising. This is accomplished by using Extension Tube Support Pins through the Frame legs and Coupling Pins. It usually takes 3 workers to raise a tower 2 Frames high, or if a crane is available, 3 or 4 Frames can be raised at one time.

If the tower cannot be put together ladder-style, then it is advisable to install the base Screwjacks and/or Extension Tubes into the Frame legs while the Frame is lying on the ground.

Once the bottom Extension Tube or Screwjacks are installed, the Frame can be raised to the vertical position, and located approximately where it is intended to be used.

The first Cross Brace should be opened to form its "X", and the hole in the bottom arm is positioned over the lower Jetlock. Then the arm is merely pushed onto the Jetlock. The Jetlock spring ensures that the brace will not become disconnected.

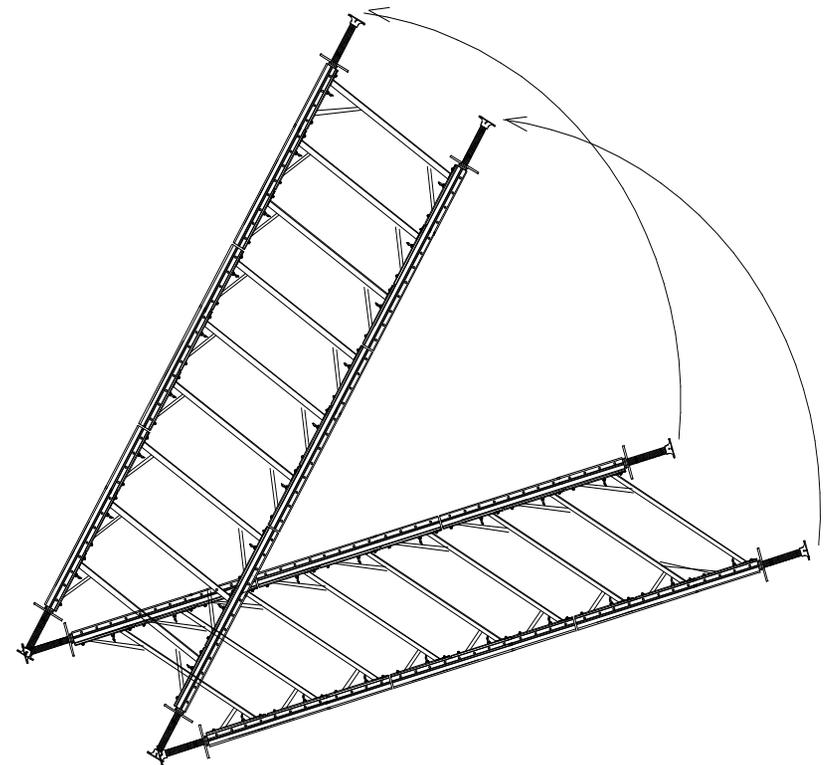
The upper arm of the Cross Brace should now be pushed onto the appropriate upper Jetlock.

The second Cross Brace can be installed on the Frame at this time. Follow the same procedure as for the first Cross Brace.

The second Frame is then moved approximately into its correct position.

The Cross Braces can now be connected to the second Frame. They are pushed onto the Jetlocks to connect both Frames together. The Jetlock springs ensure that the braces will not become disconnected.

If Screwjacks have been installed on the bottom, they should be adjusted at this time to position and level the tower.





If more than one Cross Brace is required for each side of the Frame, such as on a 2.4M (8ft) high Frame, the additional Cross Braces can now be installed.

To build a second tier onto the tower, 4 Coupling Pins are required. One Coupling Pin is inserted into the top of each Frame leg, with the rounded (bull nosed) end facing upwards.

Equipment required to secure a second tier of a tower onto another

A - 4 Coupling pins

B - 2 Frames

C - 2 Cross Braces

D - 4 Extension Tube Support Pins (optional)

E - 4 Screwjacks (optional)

F - 2 intermediate Cross Braces (optional) - See load charts for increased loads when using inter-Frame Cross Braces.

If it is intended that the Frames in the tower are to be locked together, 4 Extension Tube Support Pins are also required. When the Coupling Pin has been installed in each leg, it must then be rotated until the hole in the Coupling Pin lines up with the hole in the Frame leg. One pin of the Extension Tube Support Pin set is then placed into the top hole in the Frame leg, passed through the lower hole in the Coupling Pin, and out through the other side of the Frame leg. The self-locking feature of the Extension Tube Support Pin ensures that it will not accidentally fall out of the Frame leg.

When the Coupling Pins have been installed in all the legs of the lower tier of Frames, the next tier of Frames can be placed onto the first. If the tower is only two Frames

It is normally advisable, if 3 workers are erecting, to install the top Screwjacks into the second set of Frames before raising them into position. The Screwjacks should be adjusted to their approximate height. Then 2 workers standing on top of planks or decks on the first Frames, with one man on the ground, can lift the Frames with Screwjacks installed, one at a time, into position onto the first Frames. Again, if it is necessary that the Frames be locked together, the second pin of the Extension Tube Support Pin set is now installed into the lowest hole in the leg of the upper Frame. Because the Coupling Pin has already been properly aligned in the lower Frame, it is automatically aligned in the upper Frame.

When the second Frame has been installed at the other end of the tower, the appropriate Cross Braces can be attached.

Good planning would suggest that, if the tower were to consist of two 4ft high Frames or a 4ft high Frame and a 6ft high Frame, the 4ft high Frame should be installed at the bottom. Then two workers could lift the second tier of Frames into position above the first, from the ground, without having to build a working platform. Also, the Cross Braces for the second



25K ALUMINUM SHORING FRAMES

tier could be snapped onto the Jetlocks from the ground, saving the time and effort of installing planks and/or climbing the Frames.

If the lower tier of Frames is more than 4ft high, we recommend that a working platform be built at the top of the first tier, for safely erecting the second tier. It must be kept in mind that most jurisdictions require that the erectors be "tied off" with fall protection devices whenever the working height is above certain levels. In some areas, this minimum height is as low as 3 meters from the ground.

When intermediate braces are required, to provide additional stability, they should now be installed by locating the Cross Brace holes over the lower Jetlocks of the upper Frame and the upper Jetlocks of the lower Frame. When the brace holes are properly positioned, the tabs are then pushed onto the Jetlocks and are automatically locked in place.

Successive tiers can be installed using work platforms, in the same way as those below. In all cases, it must be assured that the Coupling Pin holes are properly aligned with the holes in the lower Frames so locking pins can be inserted.

NOTE: Worker safety is a priority. Local regulations concerning safety requirements must be fully understood and complied with.

Once the tower is erected to its final height, the Screwjacks and/or Extension Tubes and Extension Tube Base Plates are installed.

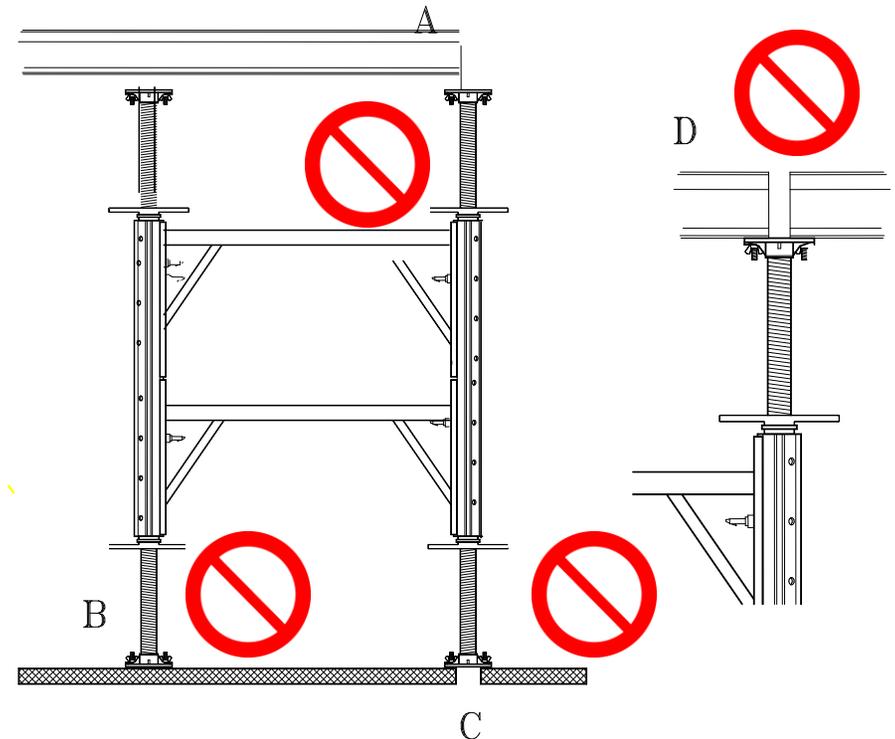
The adjusting nut on the top Screwjacks should be set so that the initial top elevation will be approximately 25mm (1/2in) high. Lowering loaded Screwjacks is very much easier than raising them once the stringer beams are installed. Light hammer blows on the adjusting nut handles will be enough to let the Screwjack move downwards into the Frame leg, so that the correct final elevation can be reached.

NOTE: If the Frames are loaded in excess of 9,000kg (20,000lb), the Quick Release Pin and Base Plate (16 Kip & 25 Kip systems) should be used on the top Screwjacks as well, especially on tall towers as the settling of the concrete will often be more than 5mm (1/4in).

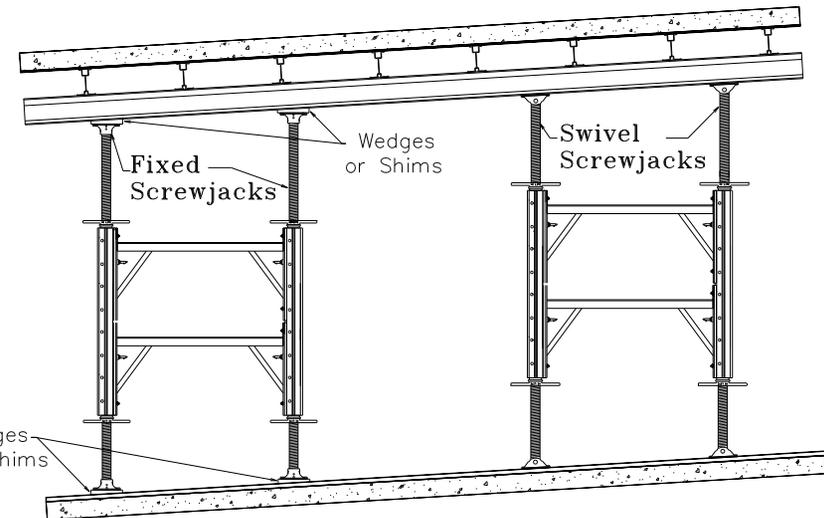
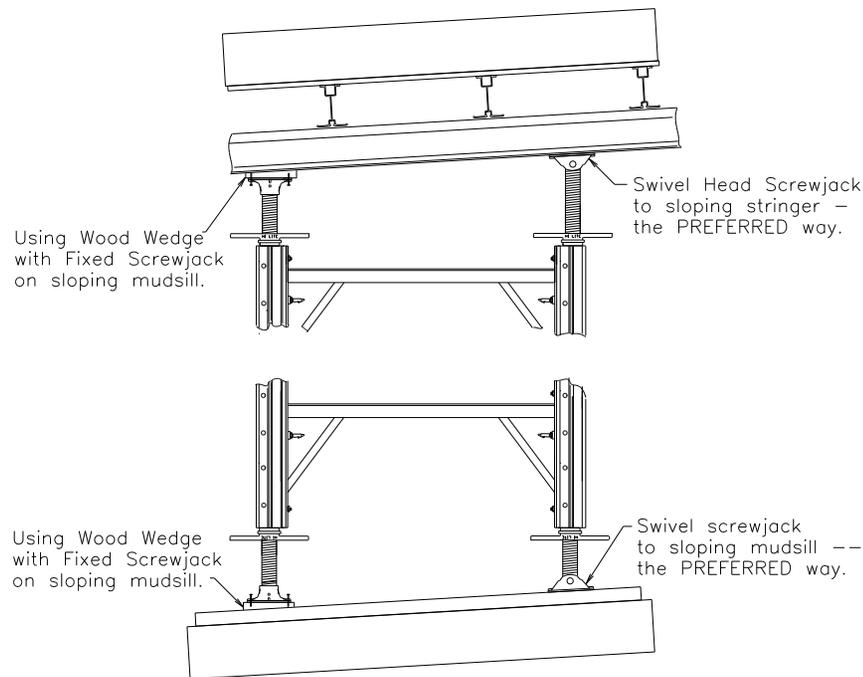
Once Extension Tube Base Plates are in position on all Frames, stringers (or ledgers), joists, and decking materials can be installed to complete the structure.

Safe Design and Erection Practices

1. Screwjacks should be centrally and evenly loaded. Unevenly loaded Screwjacks can cause eccentric loading on the Frame leg. This can seriously reduce the load-carrying capacity of the Frame leg. See illustration **A**.
2. Screwjack adjusting nuts should be tight. If the adjusting nut is not tight, the Screwjack will not carry its intended load. The stringer may deflect at the loose Screwjack, resulting in an uneven slab at that point. Other Screwjacks and Frame legs will then be carrying more than their intended load. In extreme cases, the extra loading on the surrounding Screwjacks and Frame legs could result in a deck failure. See illustration **B**.
3. Mudsills should meet between Frame legs, not under them. Gaps in mudsills under bottom plates could result in edge-loading of the plates. See illustration **C**.
4. Top and bottom plates should be centrally loaded to ensure even loading on the Screwjacks. These plates should not be loaded at their edges. This kind of loading could cause the plates to bend, and could result in deflection and possibly a failure of the support system. See illustrations **C** and **D**.
5. Stringers should meet over the centers of the Screwjacks, on the top plates. It is not recommended to by-pass stringers over Frame legs because of the danger of uneven loading on either leg.
6. Stringers should butt tightly against each other, in order to avoid edge-loading conditions on the top plate. See illustration **D**.
7. On sloped slabs, top plates must sit flat against the stringer to ensure that no eccentric loads are imposed on the Frame. In order to accomplish this, wedges or shims are required when fixed plates are used. We recommend the use of swivel plates, securely connected to the stringer. Using swivel plates is far safer than using fixed plates, and they can save many hours of installing wedges. See illustration



8. When it is necessary to design unequal extensions on Frame legs, the rated capacity should be taken on the longest extension to be used for the tower calculations.
9. On sloped or uneven grades, bottom plates must sit flat on the mudsill so that there are no eccentric loads imposed on



the Frames. To accomplish this, it is essential to use wedges or shims under fixed plates. We prefer to use swivel plates securely connected to the sill. Using swivel plates is far safer than using fixed plates, and they can save many hours of installing wedges. See illustrations.