

**PERFORM
WITH
PRECISION™**

**BACKBONE™
ONE-SIDED FORMING**

**CONCRETE
FORM SUPPORT
SYSTEMS**

APPLICATION GUIDE

**ICON FORMING
SYSTEMS INC**
SMART. STEEL. FORMWORK

 **SYMONS®**
By Dayton Superior

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I. Introduction

The Backbone™ system is a strong, adaptable concrete form support system which allows concrete pressure up to 1,250 psf. The distance between the support components is determined by the height of the wall and the allowable concrete pressure. The form is plumbed using jacks at the base.

It is possible to achieve wall heights of up to 28' and frame spacings of up to 9' depending on concrete pressure, and formwork selection. The system is easy to assemble, disassemble or transport. Except for the Frame 325, the frames can be stacked on top of each other and connected by 1" Diameter Bolts. The lowest frame is supported by adjustable jacks.

Concrete loads are discharged by the frames to the foundation or base slab via anchor rod at the front base of the formwork and via the rear compressive jack of the supporting frame. It is essential to determine if the foundation or slab is capable of receiving these loads. The side opposite the formwork (the existing building structure or shoring) must also be able to withstand the concrete pressure (see the loading details in the Appendix).

IMPORTANT:

This publication contains details for the correct handling and use of the listed and illustrated products.

- ◆ Instructions must be accurately followed. Deviations require a special proof of structural strength.
- ◆ Always follow OSHA and local safety regulations.
- ◆ Only use materials if they are in good condition. Damaged components are to be taken out of use. Use replacement parts from Dayton Superior only.
- ◆ Combining formwork systems with those of other manufacturers is a source of risk and requires special checking.
- ◆ The illustrations in this Application Guide are to be considered examples only.
- ◆ Dayton Superior explicitly reserves the right to make changes to the Backbone system and this Application Guide.

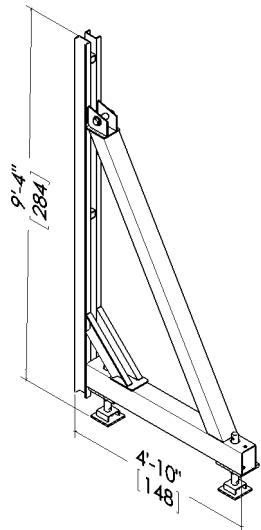


**Typical Backbone Application
(Frame 500)**

II. Components

Frame 325

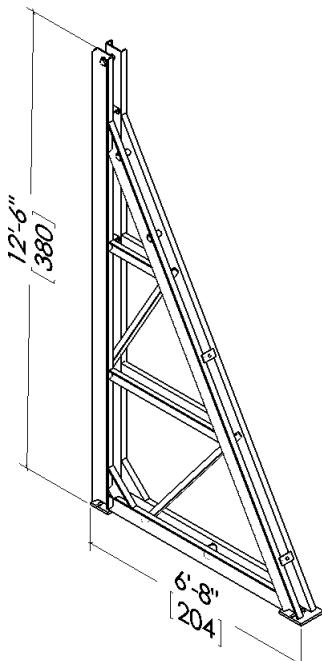
For single-sided wall formwork up to a maximum height of 10'-8" (325 cm).



Frame 325 w/ Jacks
SW456016 – 380 lbs

Frame 500

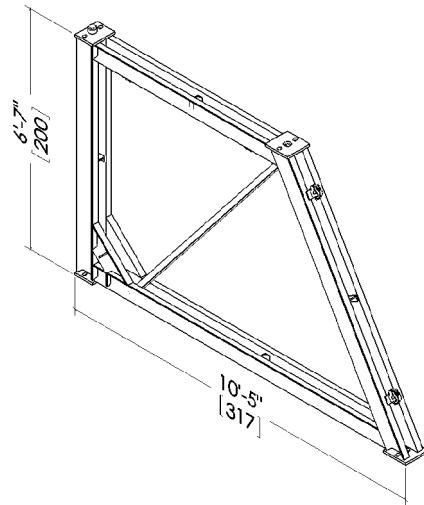
For single-sided wall formwork up to a maximum height of 16'-6" (500 cm).



Frame 500
61874, – 713 lbs

Frame 200 x 300

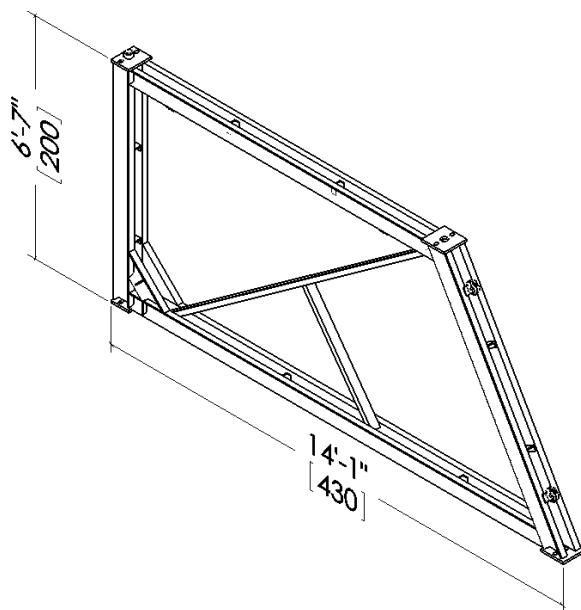
Used with the Frame 500 for single- sided wall formwork up to a maximum height of 21'-8".



Frame 200 x 300
SW456001 – 626 lbs

Frame 200 x 413

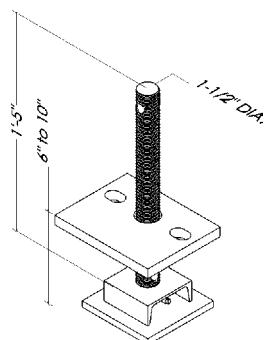
Used with the Frame 500 and the Frame 200x300 for formwork heights of up to 28'.



Frame 200 x 413
61930 – 831 lbs

1½" Diameter Jack

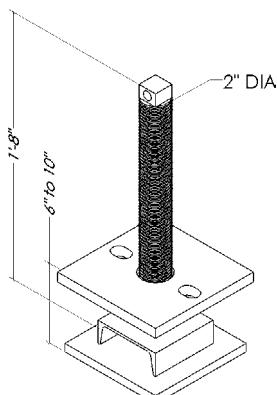
Used front and rear with 325 Frame. Used on front of 500, 200x300 and 200x413 Frames.



1 1/2" Diameter Front Jack
61877 – 27 lbs

2" Diameter Jack

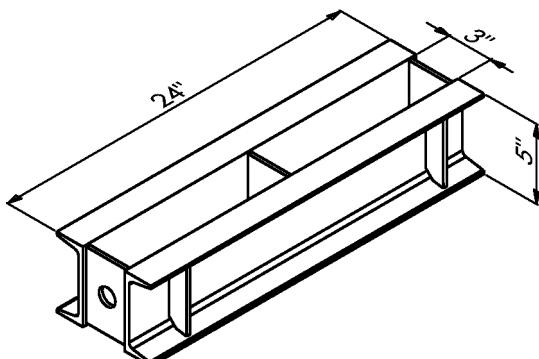
Used on rear 500, 200x300 and 200x413 Frames.



2" Diameter Back Jack
61880 – 48 lbs.

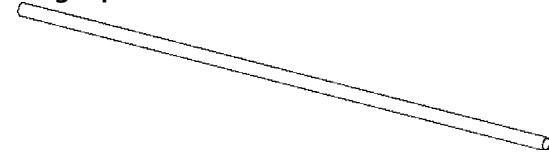
5" Tie Bar

Typically used for pour heights up to (500 cm).



5" Tie Down Waler
SW456015 – 32 lbs

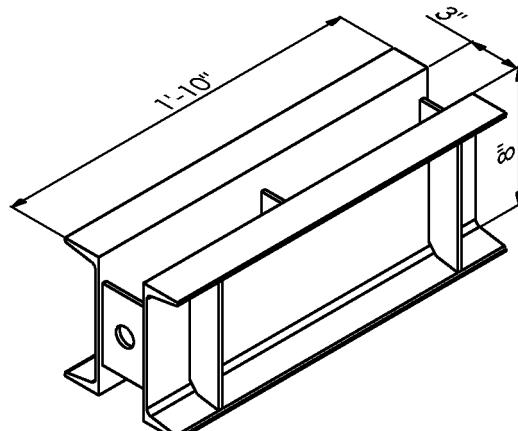
Bracing Pipe



Bracing Pipe
4', 6', 7', 8', 14' – from 10.9 to 38.1 lbs

8" Tie Bar

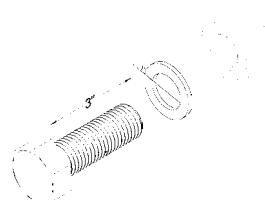
Typically used for pour heights over (500 cm).



8" Tie Down Waler
SW456012 - 63 lbs

1" Diameter Bolt, Washer and Nut

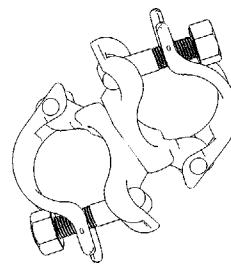
Used to attach jacks and connect frame together.



1" Diameter Bolt, Washer and Nut
61953 – 1 lb, 51398 – 0.05 lb, 51207 – 0.3 lb

Swivel Clamp (1.69x1.69)

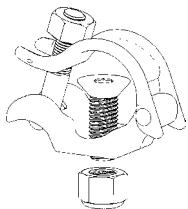
Used for cross-bracing. Uses 1.69-1.90 tubing.



Swivel Clamp (1.69x1.69)
SW450074 – 2.25 lbs

Half Clamp

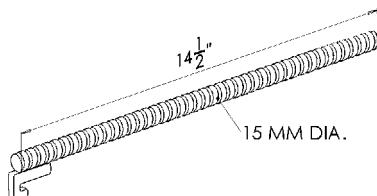
Attaches tube bracing to frame.



Half Clamp
SW456008 – 2.0 lbs

15 mm Tieback

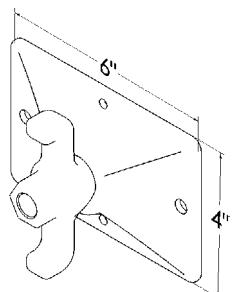
Used to connect 5" Waler with Frame. Hook inserts into the 5" Waler Hole.



15 mm Tieback
61955 – 1 lb

15 mm x 4x6 Tie Plate and Nut

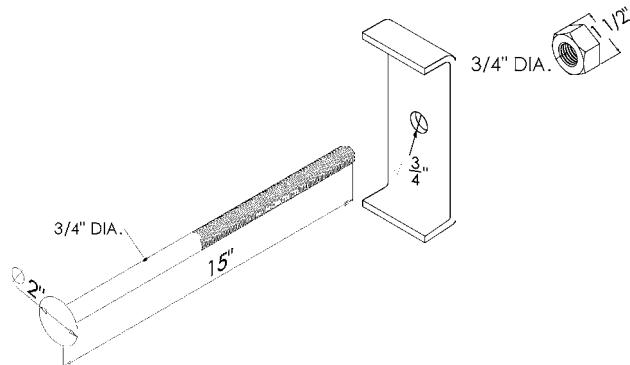
Used to connect 5" Waler with Frame. Captures and tightens the 15 mm Tieback.



15 mm x 4x6 Tie Plate and Nut
722110 – 3 lb

¾" Dia. Tie Hole Mounting Bolt with Bearing**U Plate and ¾" Dia. Tie Hole Mounting Nut**

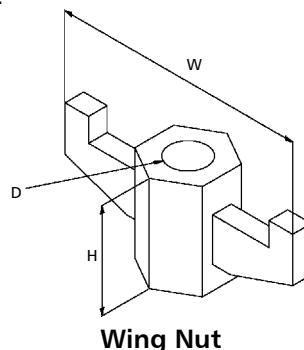
The combination creates a connection between the waler and the form. Bolt is inserted through the tie hole of the form and the 5" Waler so that the Bearing U Plate can be tightened against the Waler with the ¾" Dia. Tie Hole Mounting Nut.



**¾" Dia. Tie Hole Mounting Bolt,
Bearing U Plate
and ¾" Dia. Tie Hole Mounting Nut**
61956 – 2 lb, 61957 – 0.125lb, 61958 – 2 lb

Wing Nut

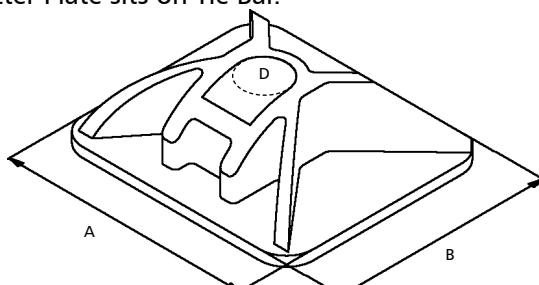
With the Batter Plate, the Wing Nut holds the Anchor Rod in place.



WING NUTS				
D	W	H	PC	Weight
20mm 7/8"	109mm 4.3"	60mm 2.4"	61945	.8lb
26.5mm 1 1/32"	154mm 6"	65mm 2.56"	61965	2.0lb

Backbone Batter Plate

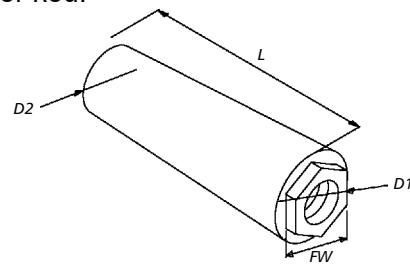
Batter Plate sits on Tie Bar.

**Backbone Batter Plate**

BATTER PLATES				
D	W	H	PC	Weight
20mm 7/8"	152mm 6"	132mm 2.4"	61945	.8lb
26.5mm 1 1/32"	178mm 7"	152mm 2.56"	61948	4.6lb

Cone Couplers

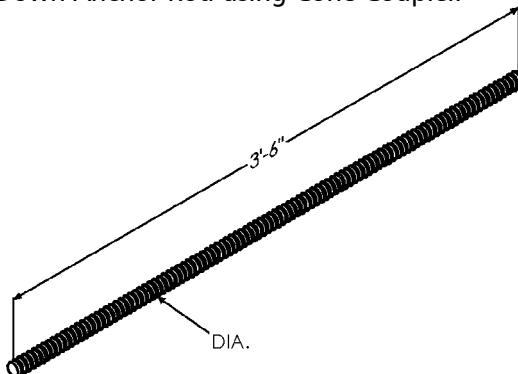
Connects the Brace Frame Anchor or Tie Down Rod to Anchor Rod.

**Backbone Cone Coupler**

CONE COUPLERS						
Dia.	L	D1	D2	FW	PC	Weight
20mm 7/8"	5 1/8"	1 3/4"	1 1/4"	1 1/4"	61944	1.6lb
26.5mm 1 1/32"	5 7/8"	2 1/8"	1 5/8"	1 1/2"	61964	2.4lb

42" Anchor Rods

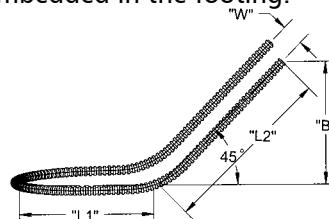
Connects to the Backbone Double Frame Anchor or Tie Down Anchor Rod using Cone Coupler.

**Backbone 42" Anchor Rod**

42" ANCHOR RODS		
Diameter	PC	Weight
20mm 7/8"	61968	3.7lb
26.5mm 1 1/32"	61962	7.3lb

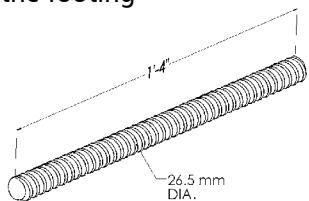
Double Frame Anchors (a.k.a. Loop Ties)

Anchor is embedded in the footing.

**Backbone Double Frame Anchor**

DOUBLE FRAME ANCHORS						
Dia.	W	L1	L2	B	PC	Weight
20mm 7/8"	14"	12 5/8"	15 5/8"	11"	61969	1.6lb
26.5mm 1 1/32"	16"	16"	24"	17"	61963	2.4lb

Tie Down Anchor Rods
Imbedded in the footing

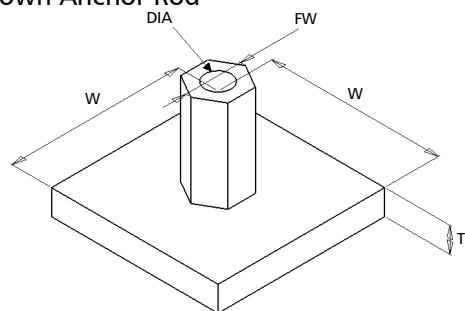


Backbone 16" Tie Down Anchor Rod

TIE DOWN ANCHOR RODS			
Dia.	Length	PC	Weight
20mm $\frac{7}{8}$ "	16"	61967	2.2lb
26.5mm $1\frac{1}{32}$ "	16"	61961	2.8lb

Anchor Plates/Nuts

Imbedded in the footing, used in conjunction with Tie Down Anchor Rod



Backbone Anchor Plate/Nut

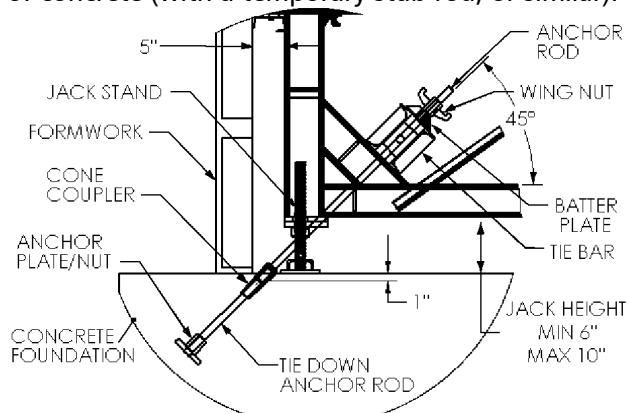
ANCHOR PLATES/NUTS					
Dia.	W	T	FW	PC	Weight
20mm $\frac{7}{8}$ "	5"	$\frac{3}{4}$ "	$1\frac{7}{16}$ "	61950	6.2lb
26.5mm $1\frac{1}{32}$ "	5"	$\frac{3}{4}$ "	$1\frac{3}{4}$ "	61949	6.4lb

III. Anchoring

The frame is anchored with a Tie Bar, which distributes the tensile loads via two Tie Rods into the anchor that was cast into the concrete foundation. Two Tie Bar sizes are available, 5" and 8". See individual Frame instructions for appropriate tie bar size. The position of the bar on the supporting frame can vary with various jack heights. With Tie Bars, loads can be effectively discharged with anchor angles at around 45 degrees. Two anchors, positioned near either end, are required per Tie Bar.

Straight Anchors

Thread one end of the Tie Down Rod into the Anchor Plate/Nut and the opposite end of the Tie Down Rod with the Cone Coupler as shown below. The combined hardware is imbedded into the concrete at a 45 degree angle, with the end of the Tie Down Rod 1" below the concrete surface and the top end of the Cone Coupler above the surface of the concrete. The threaded hole of the coupler must be kept free of concrete (with a temporary stub rod, or similar).

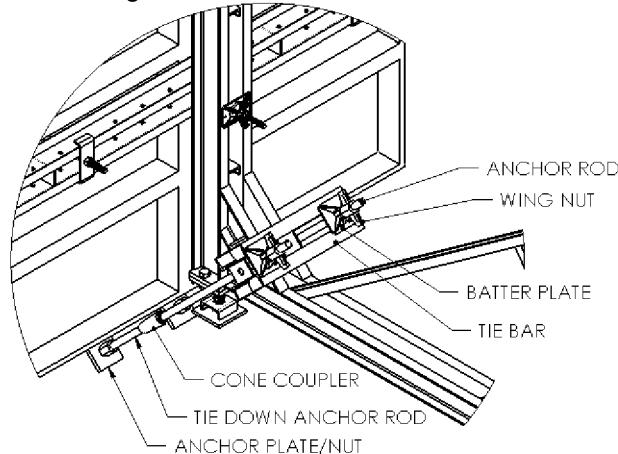


Typical Straight Rod/Tie Application

Pairs of 26.5 mm Tie Down Rod and Cone Coupler combos are generally placed 16" apart, and the 20 mm Tie Down Rods and Cone Coupler combos are placed 14" apart.

Once the concrete foundation has reached the required strength of 3000 psi, the Backbone system is positioned between pairs of anchors.

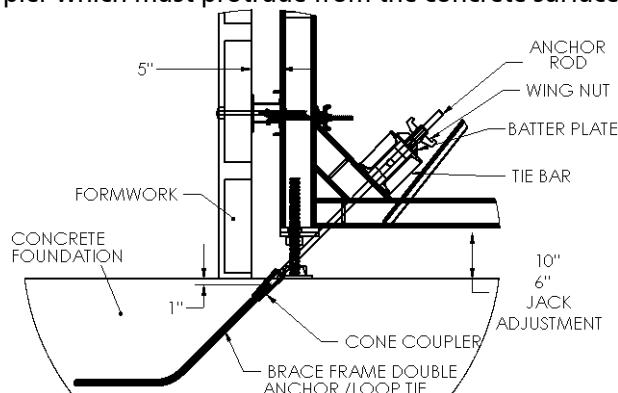
Anchor Rods are run through both ends of a Tie Bar and threaded into the Cone Coupler that emerges from the surface of the concrete foundation. Anchor Rods are fastened to the Tie Beam with a Batter Plate and a Wing Nut.



Typical Straight Rod/Tie Application

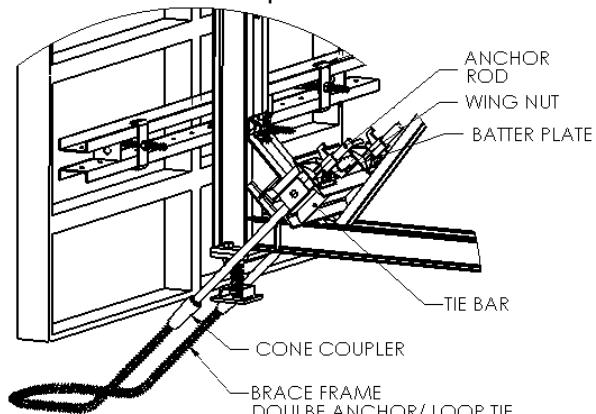
Double Frame Anchor

The Double Frame Anchor (aka Loop Tie) is imbedded into the concrete at a 45 degree angle, and 1" below the surface. The end is threaded with the Cone Coupler which must protrude from the concrete surface.



Typical Double Frame Anchor Application

Once the concrete foundation has reached its required strength of 3000 psi, the Backbone system is placed in position. The Tie Bar is placed in its position and the Anchor Rod is run through the Tie Bar and threaded into the Cone Coupler. On the other end, the Anchor Rod is positioned using a Batter Plate and a Wing Nut. Both ends are fixed in a similar fashion, depending on the system used, the 26.5 mm is generally 16" apart, and the 20 mm is 14" apart.



Typical Double Frame Anchor Application

NOTE: Anchor spacing based on anchor capacity in concrete with a 3,000 psi minimum strength.

Anchor Rating

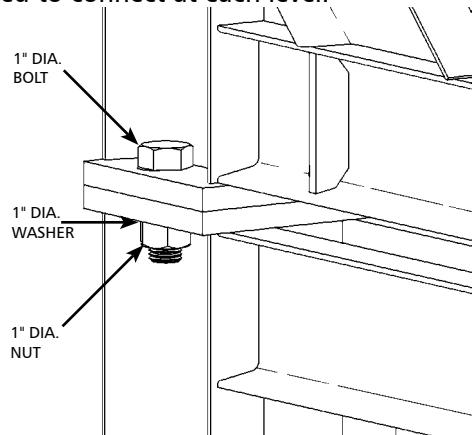
Diameter (mm)	Working Capacity (lbs)	Ultimate Capacity (lbs)
20	78,000	156,000
26.5	126,000	252,000

- Ratings based on 3,000 psi concrete strength
- Load capacity based on 2 Straight Anchor Rods or one Double Frame Anchor

IV. Connections

Frame Connection

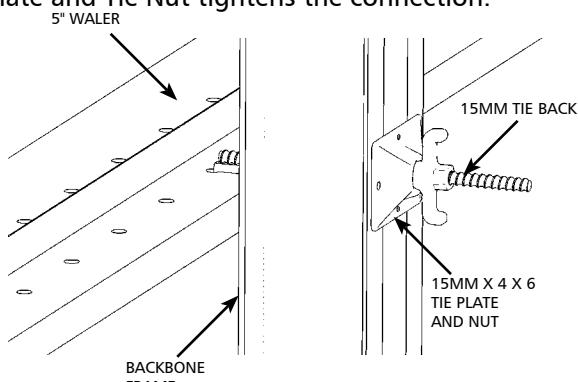
Four sets of 1" Diameter Bolts, Washers and Nuts are required to connect at each level.



Typical Connections Between Frames

Tie Back Connection

The 15 mm Tie Back is inserted through the Frame and into a hole in the 5" Horizontal Waler. The 15 mm Tie Plate and Tie Nut tightens the connection.



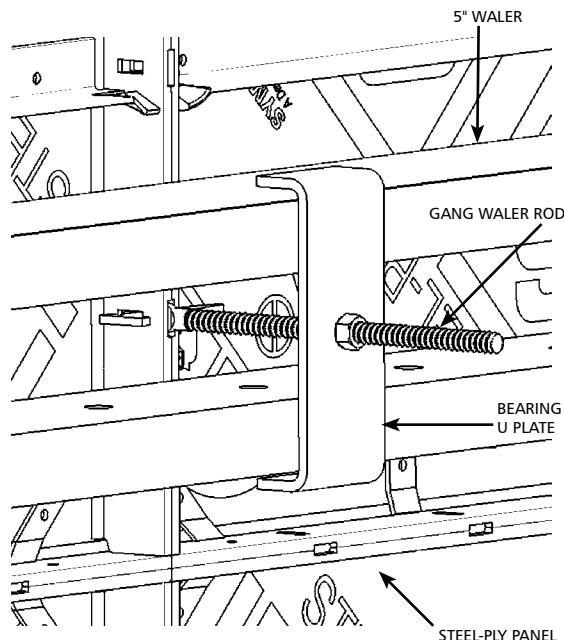
Detail view showing Tie Back Connection

NOTE: The Horizontal Walers run in the locations where tie holes are located in the form. Depending on the form system used and the layout of the form system, the waler can run anywhere along the vertical direction. Please keep in mind there may be interferences due to the geometry of the frame that may prevent connecting Tie Back at some locations. Connecting the 5" Waler with the Tie Back assures positive connection between the Waler and the Backbone system.

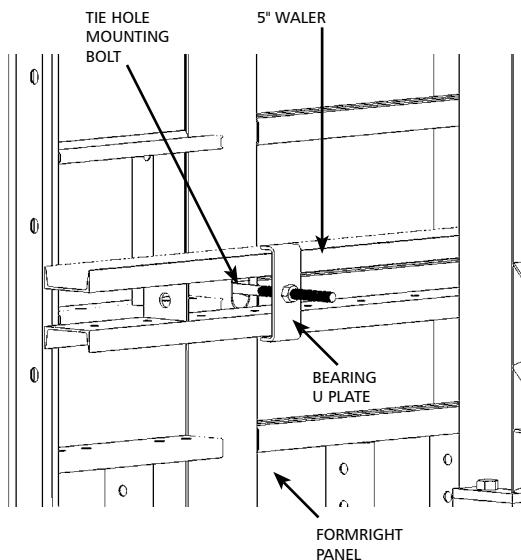
Waler Connection

The Tie Hole Mounting Bolt is inserted through tie holes. The head of the Tie Hole Mounting Nut is 2" diameter — large enough to cover tie holes of most form systems. A washer is recommended on the back side of the head if the hole is too large for the head to work properly. The back of the waler is tied with Bearing U Plate that captures the outside of the flange, this U shape resists bolt slippage during lifting procedure. The Bearing U Plate is tightened with the Tie Hole Mounting Nut. The nut is a special item provided with the Tie Hole Mounting Bolt.

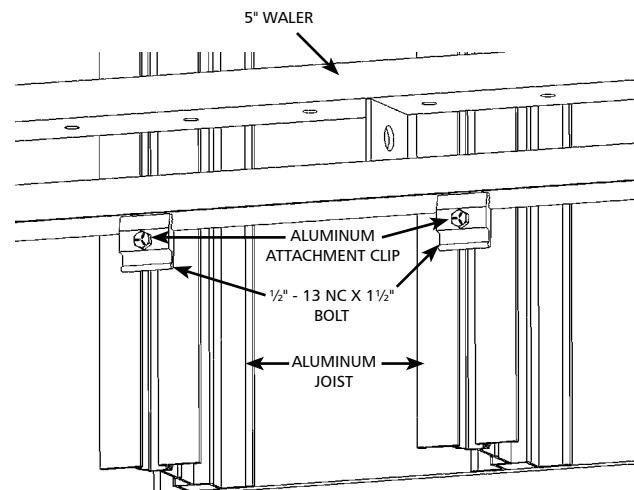
Various lengths of 5" Walers are available. The number of walers required depends on the form layout, spacing, types of form use. The waler needs a 5" minimum spacing between the form and the Backbone system. This provides room to properly clear the anchors into the footing without interference. The Tie Hole Mounting Bolt and Nut assure a positive connection between the form and the waler.



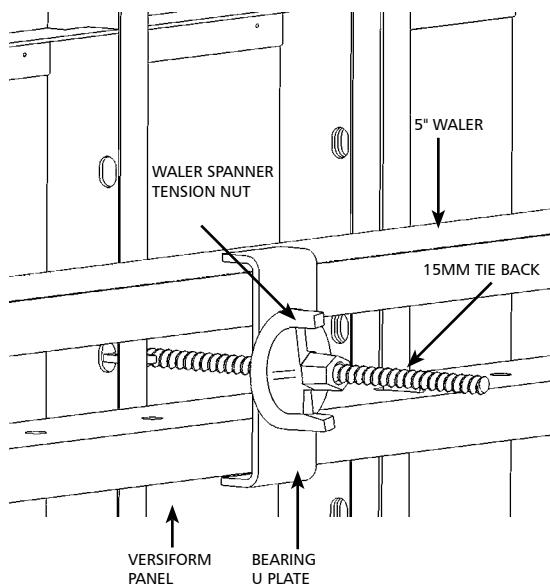
Typical Steel-Ply® Waler Connection



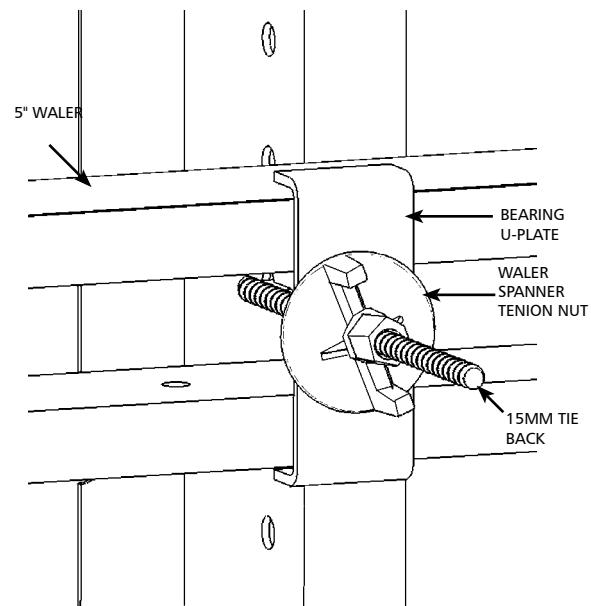
Typical FormRight™ or Rapid Clamp Waler Connection



Typical Aluminum Beam Gang Waler Connection



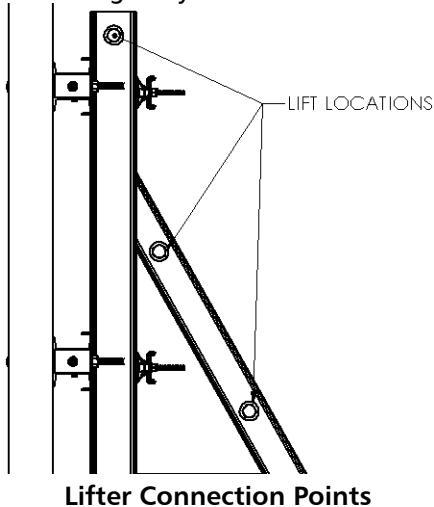
Typical Versiform® Waler Connection



Typical Max-A-Form® Waler Connection

Lifter Connection

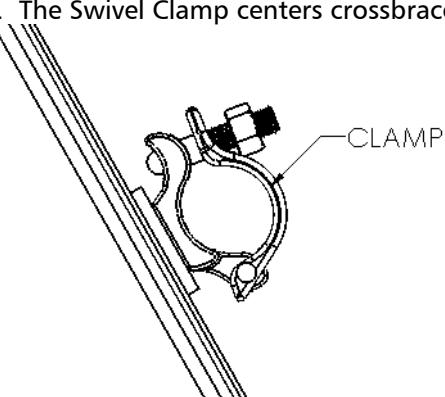
Various crane lift locations are available. They may be used one at a time or in combination to achieve proper center of gravity.



CAUTION: Maximum Lift Capacity using Single Pin is 5,200 lbs.

Tube and Clamp Connection

Tubes and clamps are used to sustain proper stability between frames. 1.90 OD tube is recommended for bracing. The Swivel Clamp centers crossbraces.

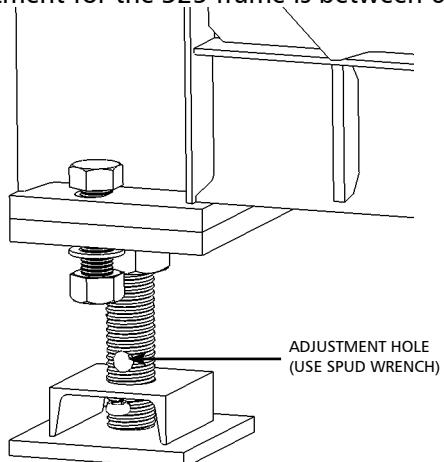


Jacks

The adjustable jacks are designed to attach to the Frame 500, Frame 200x300 and the Frame 200x413 frames. The front of the frame nearest the form requires a 1.5" Diameter Jack, and the rear requires a 2" Diameter Jack. The jacks are attached to the frame with two 1" Diameter Bolt and Nut each.

Jacks have an adjustment range from 6" minimum to 10" maximum.

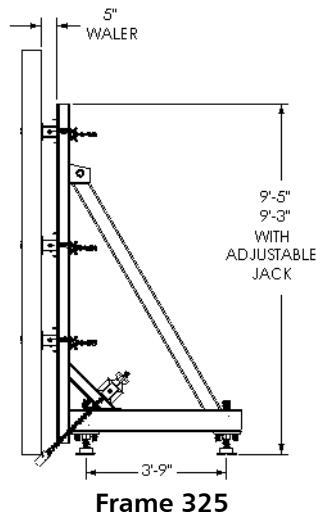
The jacks on the 325 Frames are pre-attached with 1" Diameter Bolts and Nuts. There is no need to disassemble them since the 325 can not be stacked on other frames. The 325 frame requires the 1.5" Diameter Jack in the front and rear. The jack height adjustment for the 325 frame is between 6" to 8".



V. Frames

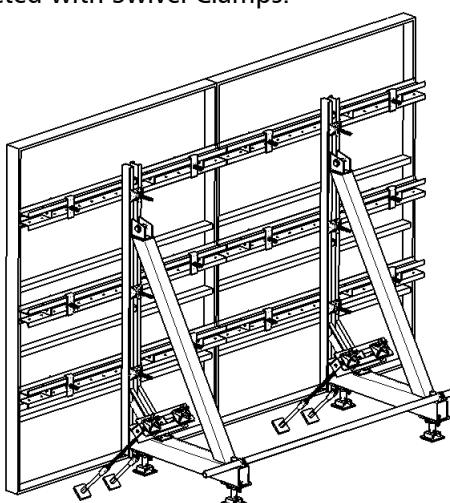
Frame 325

Frame 325 is engineered to work separately from other Backbone frames. Frame 325 does not stack with Frame 500 or any other frame. The Jacks on the system come pre-attached, and can remain attached at all times.



Frame 325

The system is designed to be used with Walers to connect the form to the Backbone Frame 325. It accommodates various wall heights, depending on the pour pressure and panel spacing. Please refer to the load chart to determine pour pressure, height and frame spacing. The chart spacing is designed based on the load capacity in the anchor. The load chart does not take form capacity into consideration. The system uses 20 mm diameter straight or loop ties for anchoring, with a 5" Tie Bar. For stability, 1.90 O.D. tubes are connected with Swivel Clamps.



Typical Frame 325 Configuration

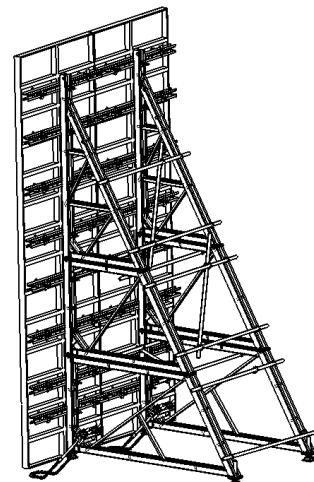
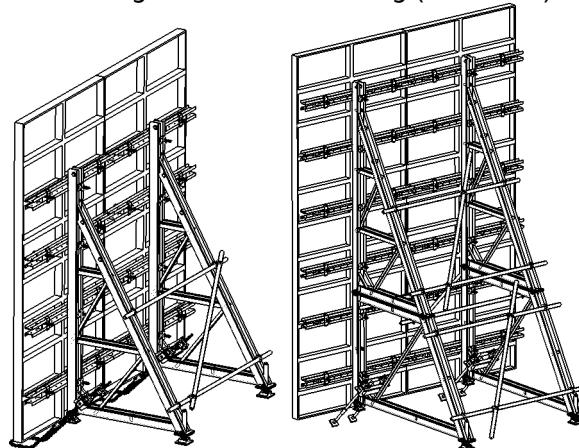
The 500, 200x300 and 200x413 Frames

The 500, 200x300 and 200x413 frames are stackable. Four 1" Diameter Bolts, Washers, and Nuts connect the top of one frame to the bottom of another. The 500 may be stacked on the 200x300, and the 200x300 may be stacked on the 200x413 frame.

The removable jacks are attached to the bottom frame. The system requires the front jack nearest to the form to be a 1.5" Diameter Jack and the jack farther from the form to be a 2" Diameter Jack.

The system requires that all forming systems have walers attached for proper form support. Tie Hole Mounting Bolts and Nuts may be used to connect the form to the 5" waler, and the 15mm Tie Backs are used to connect the 5" waler to the frame. The system is connected in a similar fashion for 500, 200x300 and 200x413 frames.

The frames should be braced with 1.90 OD pipe to provide stability. Swivel Clamp SW450074 connects cross-bracing to horizontal bracing (see below).

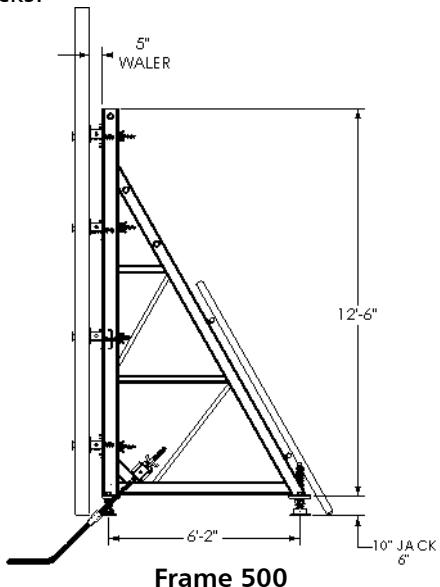


Typical Frame Configurations with Pipe Installed

Refer to the Load Chart in the Appendix to determine pour pressure, height and frame spacing. The chart spacing is designed based on load capacity of the anchor. It does not take form or waler capacity into consideration.

Frame 500

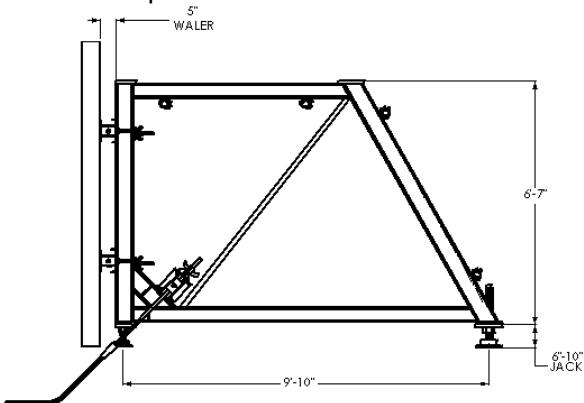
The figure shows the Frame 500, with front and back jacks.



The 500 Frame is designed to be used with 20mm anchors, either straight or loop, with the 5" Tie Bar. With this configuration, the maximum pour height is 16'-4".

Frame 200x300

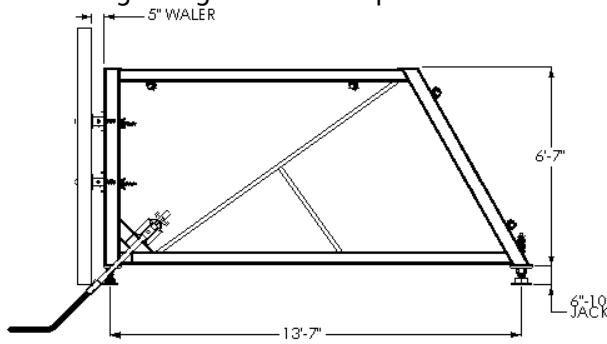
The Frame 200x300 can be used to pour low walls. The jacks are attached to the frame with 1" Diameter Grade 5 bolts, nut and washer. The 200x300 frame is designed to be used with 20 mm anchor ties. It takes both straight and loop anchor ties, with the 5" Tie Bar. With this configuration, the maximum pour height is 9'-5". The frame can be lifted using a sling around the top horizontal channel.



Frame 200x300

Frame 300x413

The Frame 300x413 can be used to pour low walls. Jacks are attached to the frame with 1" Diameter Grade 5 bolts, nut and washer. The 300x413 frame is designed to be used with 20 mm anchors, either straight or loop, with the 5" Tie Bar. With this configuration, the maximum pour height is 9'-5". The Frame can be lifted using a sling around the top horizontal channel.

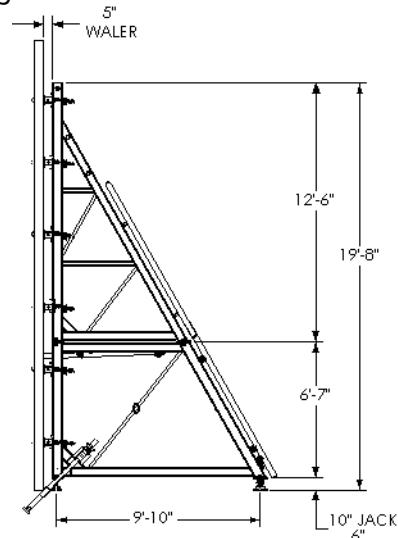


Frame 300x413

Frame 500 with Frame 200x300

The figure below shows the Frame 500 with the Frame 200x300.

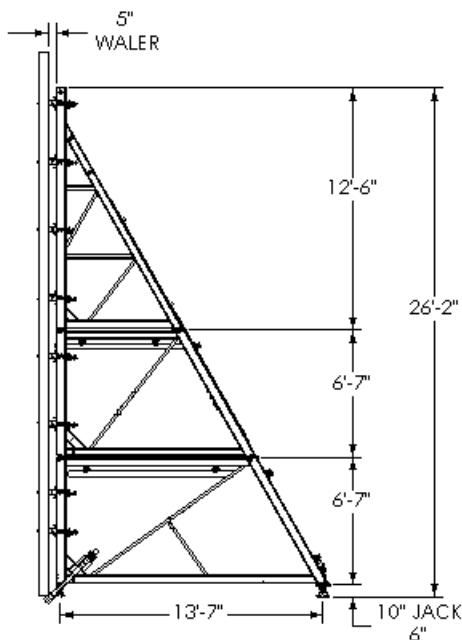
The two Frames are fastened together using the 1" Diameter Grade 5 bolt. The jacks are attached to the Frame 200x300, using 1" Diameter Bolt and Nut. The 200x300 frame is designed to be used with 26.5 mm anchors, either straight or loop anchor ties, with the 8" Tie Bar. With this configuration, the maximum pour height is 21'-8".



**Frame 500
Attached to Frame 200x300**

Frame 500 with Frame 200x300 and Frame 200x413

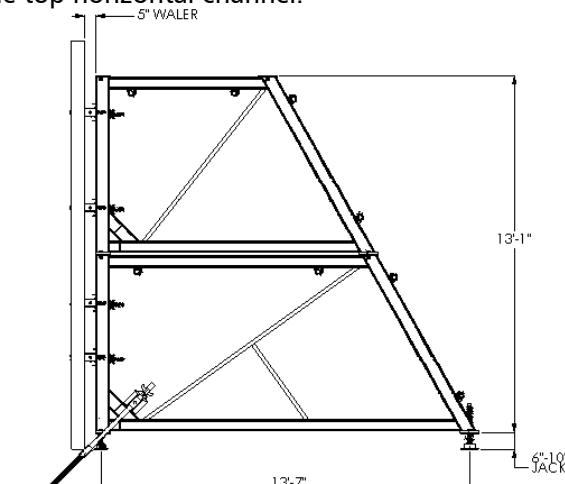
Combining Frame 500, Frame 200x300, and the Base Frame 200x413 makes it possible to create a supporting structure for tie-free walls up to 28'-0". During assembly, the jacks are attached to the Frame 200x413 using 1" Diameter Grade 5 bolts, nut and washer. The frames are fastened together with four 1" Diameter Grade 5 bolts, nuts and washer at each joint level. The 200x413 frame is designed to be used with 26.5mm anchors, straight or loop anchor ties, with the 8" Tie Bar. With this configuration, the maximum pour height is 28'-0".



**Frame 500
Attached to Frame 200x300
and Frame 200x413**

Frame 200x300 with Frame 200x413

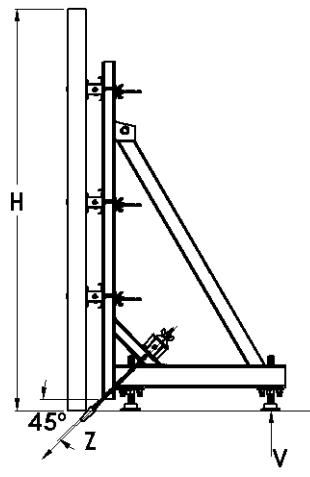
Combining Frame 200x300 with Frame 200x413 makes it possible to create a supporting structure for tie-free walls up to 16'-0". During assembly, the jacks are attached to the Frame 200x413 using 1" Diameter Grade 5 bolts, nut and washer. The frames are fastened together with four 1" Diameter Grade 5 bolts, nuts and washer at each joint level. The 200x413 Frame is designed to be used with 20mm anchors, either straight or loop anchor ties, with the 5" Tie Bar. With this configuration, the maximum pour height is 16'-0". The frame can be lifted using a sling around the top horizontal channel.



**Frame 200x300
Attached to Frame 200x413**

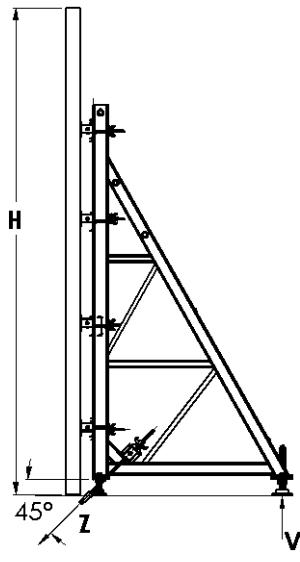
Key: H = Pouring height
 Z = Total anchor loads
 V = Jack Loads

Caution: Only when the structure is stiffened with tube-and-coupler bracing do the frames achieve their full load-bearing capacity.



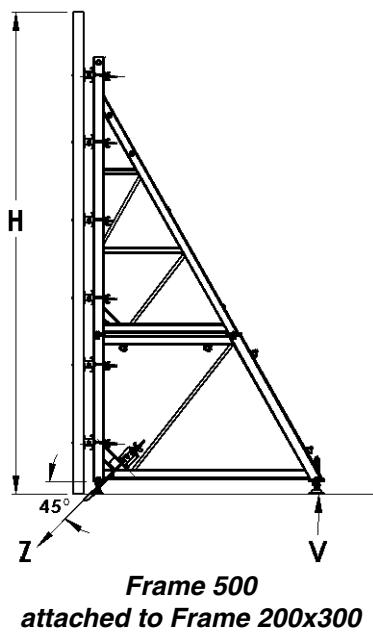
Load Capacity
Frame 325 (Anchor angle 45°)

Concrete Pressure (lbs/ft ²)	Pouring Height H (ft)	Max. Dist. Between Frames (ft)	Load Z lbs per Frame	Reaction Forces V (lbs)
800	8'-0"	8'-0"	37,451	26,482
	9'-0"	8'-0"	51,530	36,438
	10'-0"	8'-0"	68,023	48,100
	10'-6"	8'-0"	77,175	54,571
1000	8'-0"	8'-0"	38,703	27,367
	9'-0"	8'-0"	54,290	38,389
	10'-0"	8'-0"	72,895	51,545
	10'-6"	7'-3"	75,542	53,416
1250	8'-0"	8'-0"	43,913	31,051
	9'-0"	8'-0"	55,226	39,051
	10'-0"	8'-0"	75,339	53,273
	10'-6"	7'-0"	75,992	53,735



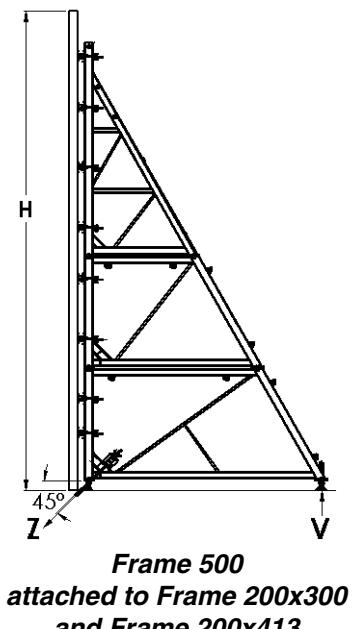
Load Capacity
Frame 500 (Anchor angle 45°)

Concrete Pressure (lbs/ft ²)	Pouring Height H (ft)	Max. Dist. Between Frames (ft)	Load Z lbs per Frame	Reaction Forces V (lbs)
800	12'-0"	8'-0"	65,154	46,071
	13'-0"	7'-9"	76,924	54,393
	15'-0"	5'-6"	77,263	54,633
	16'-3"	4'-6"	76,476	54,077
1000	12'-0"	8'-0"	71,697	50,697
	13'-0"	7'-0"	77,299	54,659
	15'-0"	4'-9"	75,499	53,386
	16'-3"	4'-0"	77,541	54,830
1250	12'-0"	8'-0"	76,331	53,975
	13'-0"	6'-6"	77,408	54,736
	15'-0"	4'-3"	74,379	52,594
	16'-3"	3'-6"	75,496	53,384



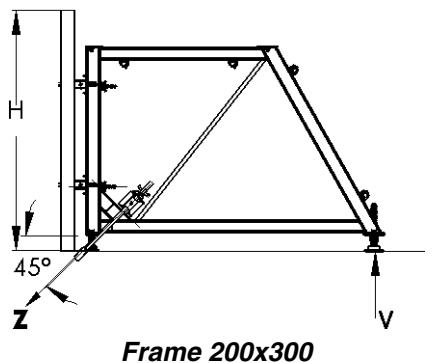
Load Capacity
Frame 500 Attached to Support Frame 200x300
(Anchor angle 45°)

Concrete Pressure (lbs/ft ²)	Pouring Height H (ft)	Max. Dist. Between Frames (ft)	Load Z lbs per Frame	Reaction Forces V (lbs)
800	18'-0"	8'-0"	110,921	78,433
	20'-0"	7'-0"	123,676	87,452
	21'-6"	6'-0"	124,992	88,383
1000	18'-0"	7'-9"	123,680	87,455
	20'-0"	6'-0"	123,178	87,100
	21'-6"	5'-0"	121,710	86,062
1250	18'-0"	7'-0"	125,800	88,954
	20'-0"	5'-3"	122,762	86,806
	21'-6"	4'-6"	125,619	88,826



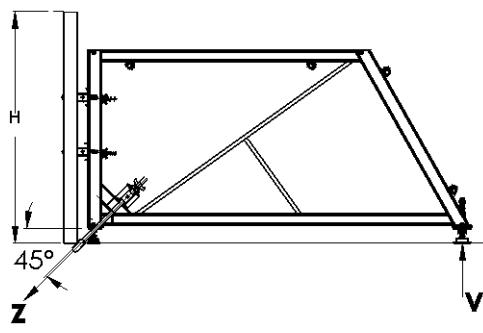
Load Capacity
Frame 500 attached to Frame 200x300 and
Frame 200x413
(Anchor angle 45°)

Concrete Pressure (lbs/ft ²)	Pouring Height H (ft)	Max. Dist. Between Frames (ft)	Load Z lbs per Frame	Reaction Forces V (lbs)
800	24'-0"	6'-6"	125,585	88,802
	25'-0"	5'-9"	121,729	86,075
	27'-0"	5'-0"	125,534	88,766
	28'-0"	4'-6"	122,444	86,581
1000	24'-0"	5'-6"	125,091	88,453
	25'-0"	5'-0'	124,895	88,314
	27'-0"	4'-0"	119,109	84,223
	28'-0"	3'-9"	121,219	85,715
1250	24'-0"	4'-9"	125,116	88,470
	25'-0"	4'-3"	123,365	87,232
	27'-0"	3'-6"	121,781	86,112
	28'-0"	3'-3"	123,082	87,032



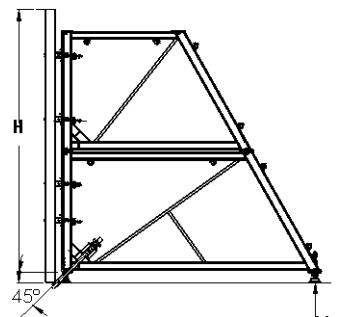
Load Capacity
Frame 200x300
(Anchor angle 45°)

Concrete Pressure (lbs/ft ²)	Pouring Height H (ft)	Max. Dist. Between Frames (ft)	Load Z lbs	Reaction Forces V (lbs)
800	7'-0"	8'-0"	10,212	7,221
	8'-0"	8'-0"	14,698	10,393
	9'-0"	8'-0"	20,114	14,222
1000	7'-0"	8'-0"	8,567	6,058
	8'-0"	8'-0"	15,180	10,734
	9'-0"	8'-0"	21,175	14,973
1250	7'-0"	8'-0"	10,609	7,502
	8'-0"	8'-0"	15,867	11,220
	9'-0"	8'-0"	21,535	15,228



Load Capacity
Frame 200x413
(Anchor angle 45°)

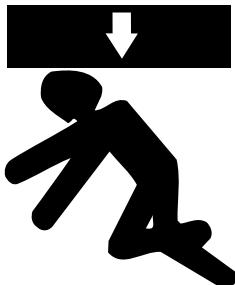
Concrete Pressure (lbs/ft ²)	Pouring Height H (ft)	Max. Dist. Between Frames (ft)	Load Z lbs	Reaction Forces V (lbs)
800	7'-0"	8'-0"	7,838	5,543
	8'-0"	8'-0"	11,079	7,834
	9'-0"	8'-0"	14,990	10,599
1000	7'-0"	8'-0"	6,650	4,703
	8'-0"	8'-0"	11,426	8,080
	9'-0"	8'-0"	15,756	11,141
1250	7'-0"	8'-0"	8,126	5,746
	8'-0"	8'-0"	11,923	8,431
	9'-0"	8'-0"	16,016	11,325



**Frame 200x300
attached to Frame 200x413**

Load Capacity
Frame 200x300 attached to Frame 200x413
(Anchor angle 45°)

Concrete Pressure (lbs/ft ²)	Pouring Height H (ft)	Max. Dist. Between Frames (ft)	Load Z lbs per Frame	Reaction Forces V (lbs)
800	13'-0"	8'-0"	37,054	26,201
	14'-0"	8'-0"	44,317	31,337
	15'-0"	8'-0"	52,250	36,947
1000	13'-0"	8-0"	41,173	29,113
	14'-0"	8-0"	49,693	35,138
	15'-0"	8-0"	59,051	41,755
1250	13'-0"	8-0"	44,366	31,371
	14'-0"	8-0"	54,143	38,285
	15'-0"	8-0"	64,968	45,939



WARNING

Improper Use of Concrete Accessories Can Cause Severe Injury or Death

Read, understand and follow the information and instructions in this publication before using any of the Dayton Superior concrete accessories displayed herein. When in doubt about the proper use or installation of any Dayton Superior concrete accessory, immediately contact the nearest Dayton Superior Service Center or Technical Service Department for clarification. See back cover for your nearest location.

Dayton Superior products are intended for use by trained, qualified and experienced workmen only. Misuse or lack of supervision and/or inspection can contribute to serious accidents or deaths. Any application other than those shown in this publication should be carefully tested before use.

The user of Dayton Superior products must evaluate the product application, determine the safe working load and control all field conditions to prevent applications of loads in excess of a product's safe working load. Safety factors shown in this publication are approximate minimum values. The data used to develop safe working loads for products displayed in this publication are a combination of actual testing and/or other industry sources. Recommended safe working loads given for the products in this publication must never be exceeded.

Worn Working Parts

For safety, concrete accessories must be properly used and maintained. Concrete accessories shown in this publication may be subject to wear, overloading, corrosion, deformation, intentional alteration and other factors that may affect the device's performance. All reusable accessories must be inspected regularly by the user to determine if they may be used at the rated safe working load or should be removed from service. The frequency of inspections depends upon factors such as (but not limited to) the amount of use, period of service and environment. It is the responsibility of the user to schedule accessory hardware inspections for wear and remove the hardware from service when wear is noted.

Shop or Field Modification

Welding can compromise a product's safe working load value and cause hazardous situations. Knowledge of materials, heat treating and welding procedures is necessary for proper welding. Consult a local welding supply dealer for assistance in determining required welding procedures.

Since Dayton Superior cannot control workmanship or conditions in which modifications are done, Dayton Superior cannot be responsible for any product altered in the field.

Interchangeability

Many concrete accessory products that Dayton Superior manufactures are designed as part of a system. Dayton Superior strongly discourages efforts to interchange products supplied by other manufacturers with components supplied by Dayton Superior. When used properly, and in accordance with published instructions, Dayton Superior products have proven to be among the best designed and safest in the industry. Used improperly or with incompatible components supplied by other manufacturers, Dayton Superior products or systems may be rendered unsafe.

Installation

WARNING

1. Dayton Superior Corporation products shall be installed and used only as indicated on the Dayton Superior Corporation installation guidelines and training materials.
2. Dayton Superior Corporation products must never be used for a purpose other than the purpose for which they were designed or in a manner that exceeds specific load ratings.
3. All instructions are to be completely followed to ensure proper and safe installation and performance
4. Any improper misuse, misapplication, installation, or other failure to follow Dayton Superior Corporation's instruction may cause product malfunction, property damage, serious bodily injury and death.

THE CUSTOMER IS RESPONSIBLE FOR THE FOLLOWING:

1. Conformance to all governing codes
2. Use of appropriate industry standard hardware
3. The integrity of structures to which the products are attached, including their capability to safely accept the loads imposed, as evaluated by a qualified engineer.

SAFETY INSTRUCTIONS:

All governing codes and regulations and those required by the job site must be observed. Always use appropriate safety equipment

Design Changes

Dayton Superior reserves the right to change product designs, rated loads and product dimensions at any time without prior notice.

Note: See Safety Notes and Safety Factor Information.



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