

DESUTA
CONCRETE FORMS

RASTO APPLICATION GUIDE



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About this Guide:

This application/assembly guide for the Desuta Rasto Gang Clamp forming system is customized for the use of Desuta Concrete Forms customers for the use of DCF equipment. This guide is for informational purposes only. Although every effort has been made to ensure the accuracy of the content, DCF shall not be liable for any information published in this guide.

About the Company:

Desuta Concrete Forms is located about 40 miles north of Pittsburgh, PA and is a full-service concrete forming and shoring rental company. DCF fully stocks Symons Steel Ply, Ulma Megalite handset clamp and Desuta Rasto Gang Clamp form systems, as well as 10K-Hi load shoring. DCF's goal is to furnish to its customers a quality forming system, combined with the best engineering, jobsite service and competitive pricing. The purpose of this guide is to help DCF customers understand the basic assembly and share time saving shortcuts we have learned by owning, improving and modifying the system to what it is today.

DCF Rasto Sizes and Conversions Metric to U.S. (Imperial) Conversions

Metric Dim. (cm)	U.S. Dim. (in.)	Nearest $\frac{1}{8}$ "
30	11.18	11 $\frac{3}{4}$
45	17.72	17 $\frac{3}{4}$
50	19.69	19 $\frac{3}{4}$
55	21.65	21 $\frac{5}{8}$
60	23.62	23 $\frac{5}{8}$
65	25.59	25 $\frac{5}{8}$
70	27.56	27 $\frac{1}{2}$
75	29.53	29 $\frac{1}{2}$
90	35.43	35 $\frac{3}{8}$
150	59.06	59
240	94.49	94 $\frac{1}{2}$
270	106.30	106 $\frac{1}{4}$

System Features

The Desuta Rasto concrete forming system is a modular system which may be used in handset or gangform applications, but is primarily used in gangform applications featuring our Giant Panel.

Modular Versatility

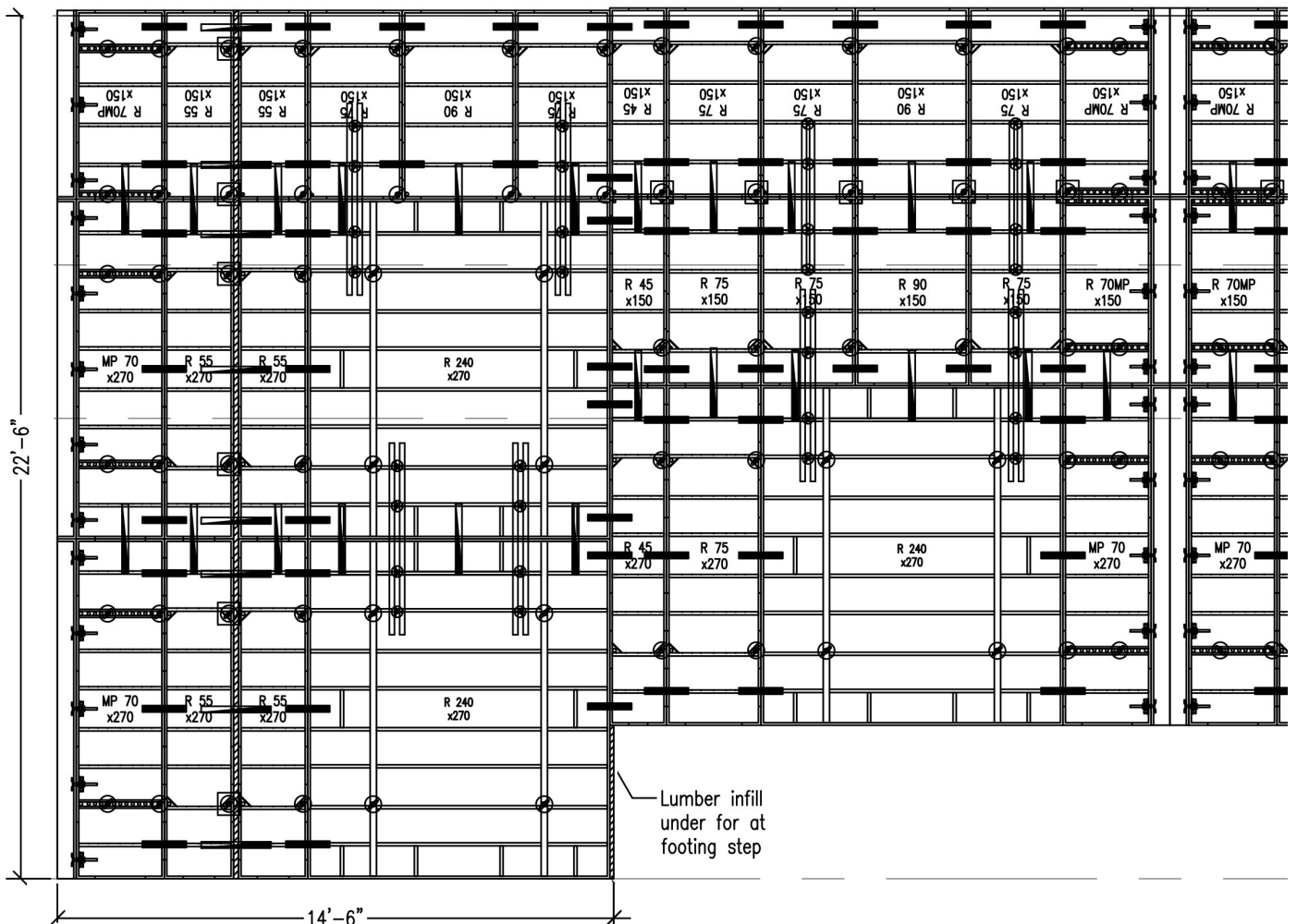
Panels come in a variety of sizes and can be combined vertically or horizontally to create almost any dimension required. A full line of accessories and hardware makes configuring gangs and setting details simple. Clamp connections eliminate the need for lumber walers even when moving large gangs.

System Strength

The form face is a 15 mm (5/8") 220/220 Russian Birch plywood with a high density overlay on both sides to provide a high quality concrete finish and to extend panel life with the exception of our Giant Panel and Inside Corners. They are faced with 15AL Alkus form facing.

Panels, clamps and ties combine to create a strong system that can withstand 1250 psf of concrete pressure.

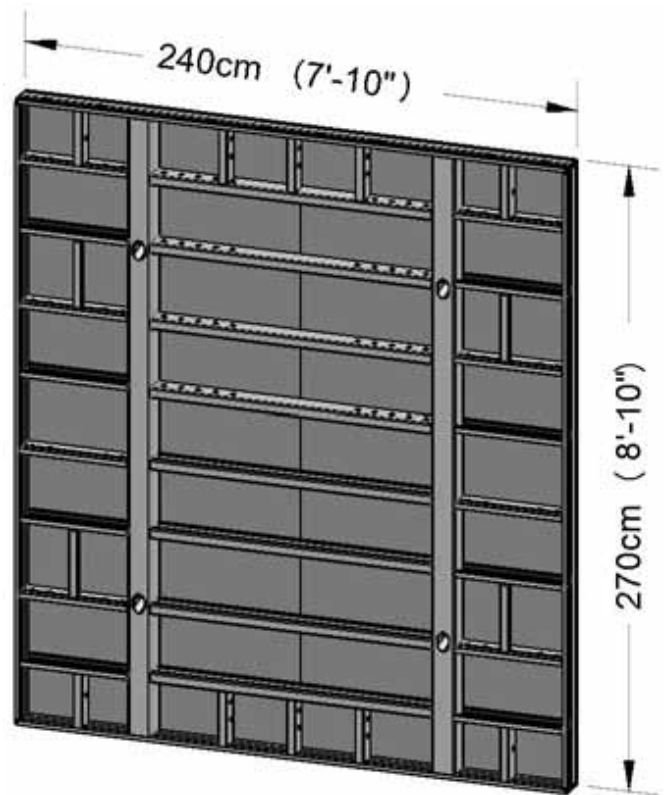
Rasto panels are clamped together to create almost any wall or column dimension. They can also be stepped to accommodate uneven ground elevations.



Basic Equipment

Panels

Description	Lbs.
Giant Panel 240/270 cm (7'10" x 8'10")	650
Panel 90/240cm (35.4" x 7'10")	144
Panel 60/240 cm (23.6" x 7'10")	100
Panel 30/240 cm (11.8" x 7'10")	50
Panel 90/270 cm (35.4" x 8'10")	153
Panel 75/270 cm (29.5" x 8'10")	133
Panel 65/270 cm (25.6" x 8'10")	124
Panel 60/270 cm (23.6" x 8'10")	118
Panel 55/270 cm (21.7" x 8'10")	112
Panel 50/270 cm (19.7" x 8'10")	107
Panel 45/270 cm (17.7" x 8'10")	100
Panel 30/270 cm (11.8" x 8'10")	96
Panel 90/150 cm (35.4" x 4'11")	91
Panel 75/150 cm (29.5" x 4'11")	80
Panel 65/150 cm (25.6" x 4'11")	72
Panel 60/150 cm (23.6" x 4'11")	69
Panel 55/150 cm (21.7" x 4'11")	66
Panel 50/150 cm (19.7" x 4'11")	62
Panel 45/150 cm (17.7" x 4'11")	59
Panel 30/150 cm (11.8" x 4'11")	50

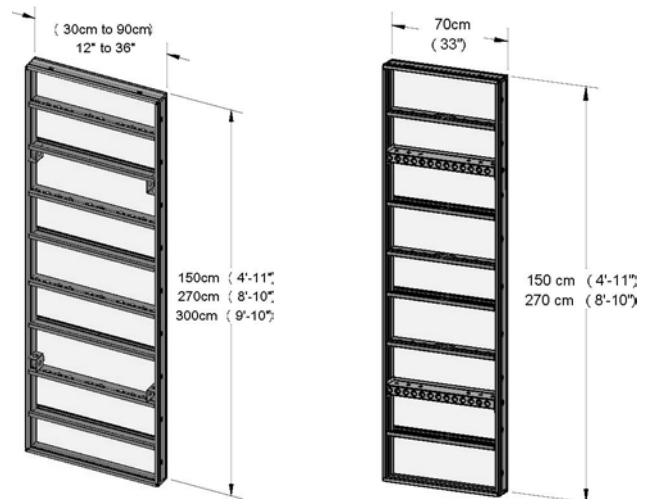


Giant Panel

MP Panel

MP Panels form angled corners or offset walls and pilasters. Panels have extra tie holes at approximately 2" pacing to allow tying for non-typical applications.

Description	Lbs.
MP Panel 70/270 (27.6" x 8'10")	133
MP Panel 70/150 (27.6" x 4'11")	87



Panel

MP Panel

Note: All U.S. (Imperial) measurements are nominal. See Conversion Chart at the front of this guide.

Corners

Inside Corner

DCF Rasto inside corner is redesigned to be a solid, rugged, fixed corner. It has permanently bolted steel plates with additional tubing lined with Alkus form facing. Our corner is designed to handle any ganform, heavy pressure applications.

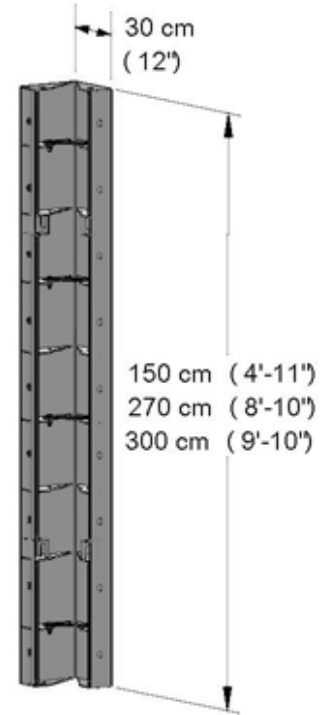
Description	Lbs.
Inside Corner 30/270 (11.8" x 8'10")	170
Inside Corner 30/150 (11.8" x 4'11")	95



Bolted Steel Plate



Alkus Form Facing



Outside Corner

Forms 90° corners. For use with center tension bolts or accessory bolts.

Description	Lbs.
Outside Corner-aluminum	45
Outside Corner-aluminum	25

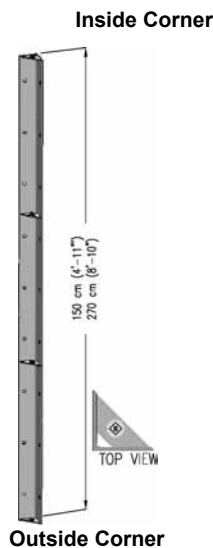
Hinged Corner

Forms large wall corner angles from 90° to 300°. Attaches to panels with Centering Tension Bolt and nut or accessory bolt.

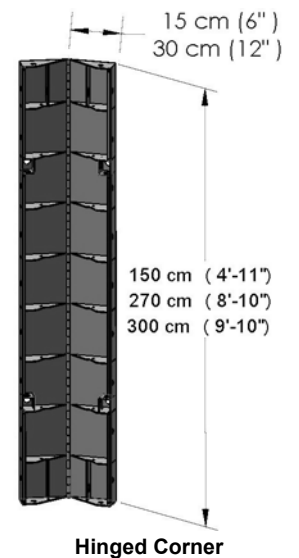
Description	Lbs.
Hinged Corner 15/270 (5.9" x 8'10")	111
Hinged Corner 15/150 (5.9" x 4'11")	62

Forms corner angles from 60° to 150°. Can be attached to panels with the Rasto Panel Clamp or the Centering Tension Bolt and Nuts.

Description	Lbs.
Hinged Corner 30/270 (11.8" x 8'10")	159
Hinged Corner 30/150 (11.8" x 4'11")	92



Outside Corner



Hinged Corner

Connecting Components

NEVI Clamp

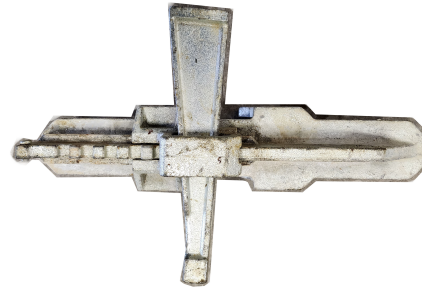
One strike of a hammer will align panels and make joints flush and tight. This smaller clamp is idea for handset applications.



NEVI Clamp

Rasto Hammer Clamp

Rasto Hammer Clamp will align panels and make joints flush and tight. Works in all applications. Perfect with gang forming.



Rasto Hammer Clamp

Hammer Outer Corner Clamp

Connects two panels to form an outer corner.

Adjustable Clamp

Connects fillers up to 6" wide and support extension panels. Also used in lieu of a waler, spanning horizontal joints.

Accessory Bolt

For use with the Outside Corners, Filler Angles, and Hinged Corners, used with a Centering Nut.

Centering Tension Bolt

Required to distribute loads evenly across the Rasto profile. Connects panels to hinged corners, mounting bulkheads, and other applications.

Centering Nut

Centers itself into the panel frame edge for connections. Used with Centering Tension Bolt, Rasto Accessory Bolt, Water Spanners, and Water Hooks.

Waler Spanner 30

Connects multi-purpose walers and adjustment walers to panels.

Waler Hook

Used to connect walers to panels.

Hold Down Bracket

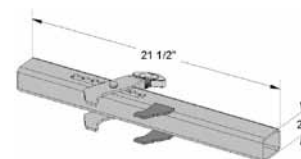
Used for anchoring formwork.

Climbing Rod & Nut

Used primarily when giant panels are laid horizontally to assist in climbing formwork.



Hammer
Corner
Clamp



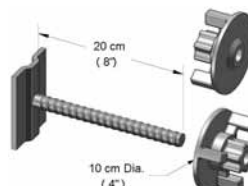
Adjustable Clamp



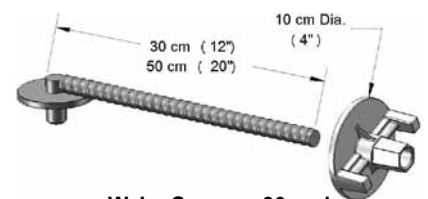
Accessory
Bolt



Climbing Rod



Centering Tension
Bolt and Nut



Waler Spanner 30 and
Waler Spanner Tension Nut

Walers

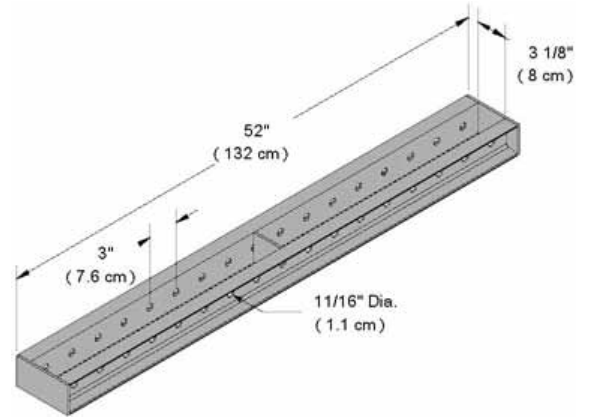
DCF has created high strength steel walers for stiffening gangs and for bulkheads. Available in 4', 5' and 6' lengths.

Steel Waler 4', 5', 6'



Short Waler

Used for stiffening stacked panel joints.



Short Waler

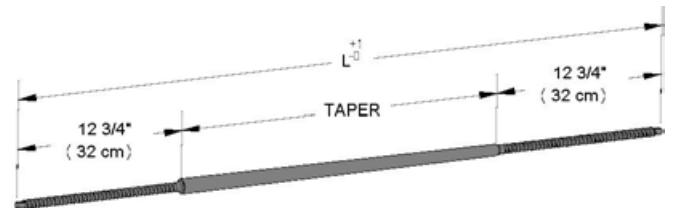
Taper Tie

15mm (5/8" nom.)

Description	Lbs.
15 mm dia. x 41" - 7" to 16" thick walls	5.1
15 mm dia. x 49" - 15" to 24" thick walls	5.5

She Bolt

Reusable outer tie unit. Used with 15 mm tie rod inner unit and 15 mm tie nuts.



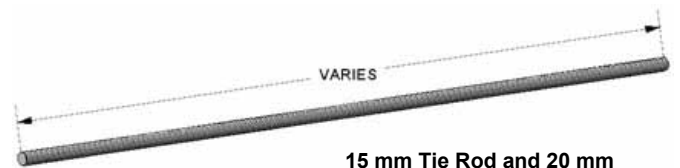
Taper Tie

She Bolt Cone

Reusable cone plug 12" x 15mm tie rod and 15mm nuts create a she bolt assembly which thread onto 15mm tie rod inner unit.

Tie Rod

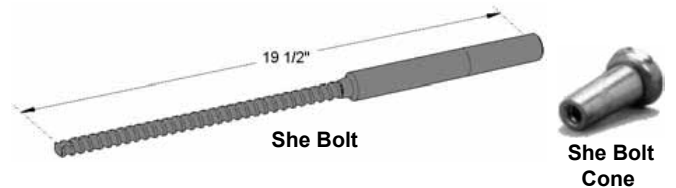
Available up to 20' long.



15 mm Tie Rod and 20 mm

Tie Rod Sleeves

Plastic spacer-length depends on wall thickness - locally cut-to-length (wall thickness minus 1"). Tie Rod Sleeves (cut to length) together with Tie Sleeve Cones ensure the proper spacing between the two erected panels of formwork. DCF can pre-cut sleeves to save valuable field time.



She Bolt

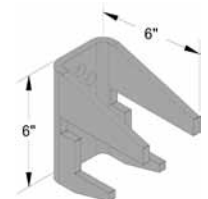
She Bolt Cone

Internal Plastic Spacer Cones

After stripping formwork, the cones are extracted and can be used again.



Tie Rod Sleeve with Internal Plastic Spacer Cones



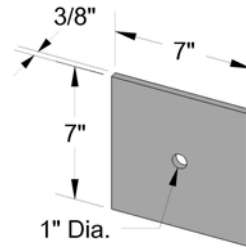
Tie Holding Clip

Tie Holding Clip

To be used for tying outside of the panel edge profile at bulkheads or for top ties.

Frame Tie Plate

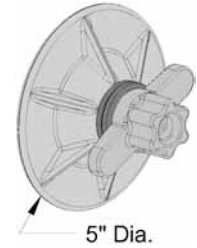
(See Section III for applications.)



Frame Tie Plate

Standard Tie Nut

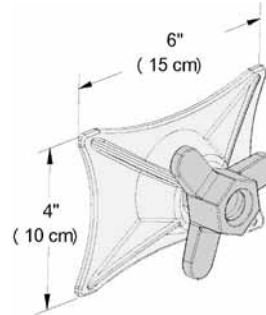
Can be used to replace Tie Nut 85 in most applications. (Nut does not pivot.)



Standard Tie Nut

Rasto Swivel Tie Nut

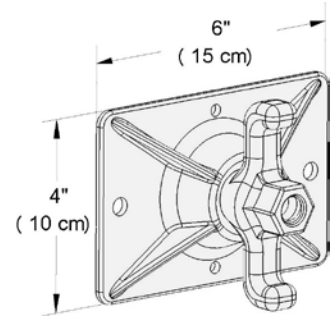
Swivel bearing plate included. (Nut pivots up to 10°.)



Swivel Tie Nut

15mm x 4" x 6" Tie Plate and Nut

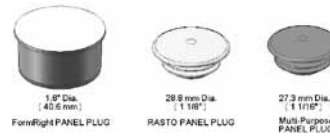
Tie plate and nut with 10° swivel.



15mm x 4" x 6" Tie Plate and Nut

Panel Plugs

For plugging unused tie holes.

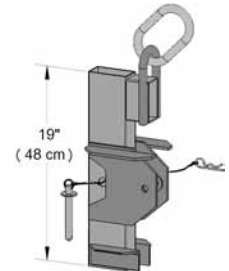


Panel Plugs

Lifting Brackets

RtL – Panel Lift Bracket

This component has a 2250 lb. working capacity with a 5:1 safety factor.



RTL - Panel Lift Bracket

Standard Lifting Bracket

Standard Lifting Bracket can be used to pick up smaller gangs. The bracket can be placed anywhere on the top/side rail of the panel. Refer to specific form layout drawing / DCF representative for capacities.

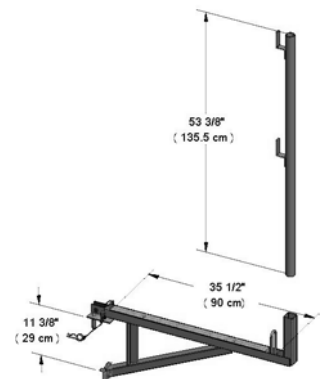
Standard Lifting Brackets



Fall Protection

Walkway Bracket and Guardrail Post

The Walkway Bracket can be attached to either vertically or horizontally installed panels and is secured with supplied Spring Pin. When connected to horizontally installed panels, a rivet and hitch pin is required.



Walkway Bracket and Guardrail Post

Form Alignment and Attachments

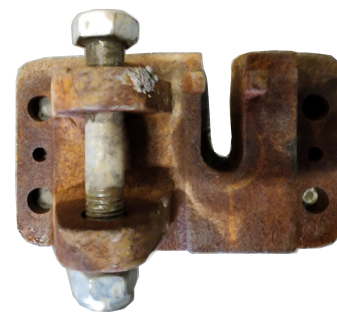
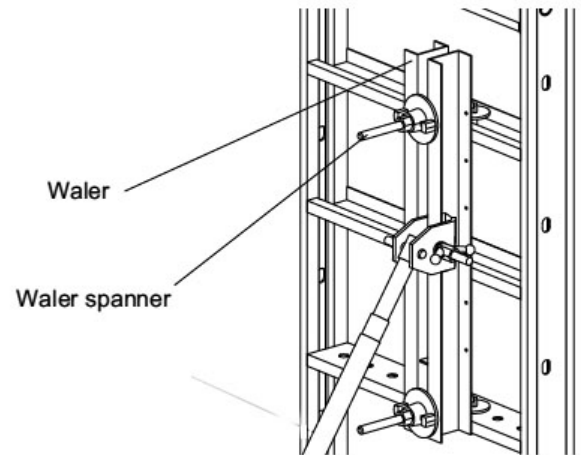
Pipe Braces

DCF stocks a variety of pipe braces to accommodate virtually any form height. These rugged yet manageable braces are ideal for plumbing and bracing the Rasto formwork.



Rasto Pipe Brace Head

The Rasto Pipe Brace Head allows a nimble, quick connection on any vertical seam. It also connects to a short waler if a brace needs to be placed between vertical joints.



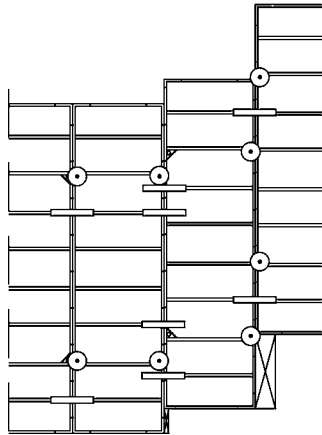
Pipe Brace Shoe

Part No.	Type	Brace Length	Weight lbs	Ultimate Brace Load w/o Knee Bracing—Max lbs
B1	Standard	7'-6"(MIN.) to 14'-0"(MAX)	95.0	9,750/6,600
B4	Heavy Duty	14'-0"(MIN.) to 23'-6"(MAX)	130.0	6,500/1,950
B5	Long Heavy Duty	22'-6"(MIN.) to 39'-0"(MAX)	208.0	6,500/Not Recommended

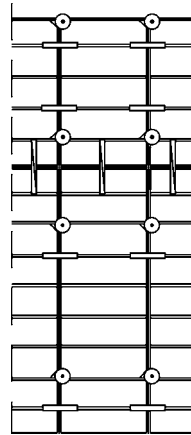
Arrangement of Clamps and Wall Ties

Every Rasto panel provides four tie holding bays next to the edge profile (six on 300 Panels). One tie nut also supports the adjacent panel simultaneously. The tie holes in the plywood are fortified by inserts. Note recommended use of Panel Clamps and Adjustable Clamps at the panel joints.

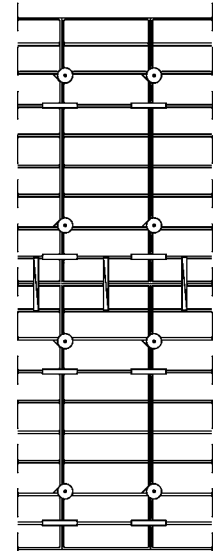
- ⊙ Tie Nut and Tie Rod
- ▣ Tie Nut w/Frame Tie Plate (See Note 3.)
- ▭ Rasto Hammer Clamp (See Note 1.)
- ▧ Adjustable Clamp (See Note 2.)



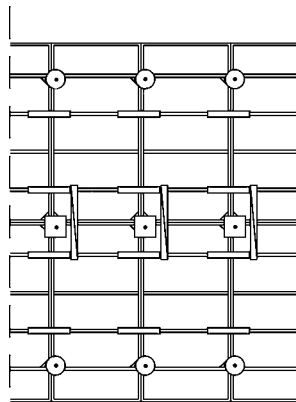
Panels align for stepped elevation



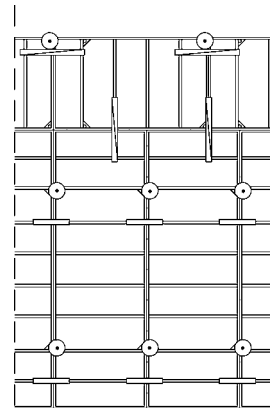
270 Panels
With 150 Panel extensions



270 Panels
Stacked two elevations
high



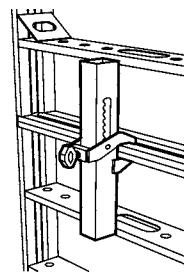
150 Panels
Stacked two elevations high



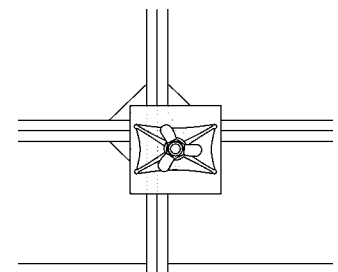
270 Panels
wWith horizontal panel extension



Hammer Clamp or Nevi Clamp



Adjustable Aligning Clamp
or Strongback Clamp



Frame Tie Plate

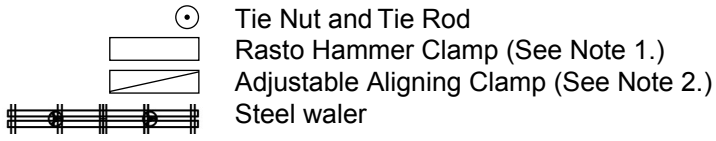
Note 1: Clamp straddles panel crossmem-bers.

Note 2: Be sure clamp is fully engaged. Clamp ends must be in contact with crossmembers to provide adequate support.

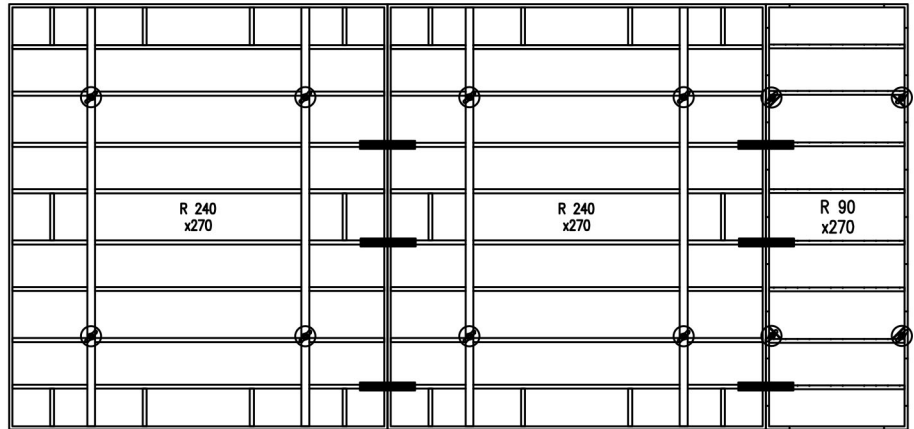
Note 3: When tying at panel corners, a Frame Tie Plate is required to support all four corners.

Arrangement of Clamps and Ties for Giant Panels

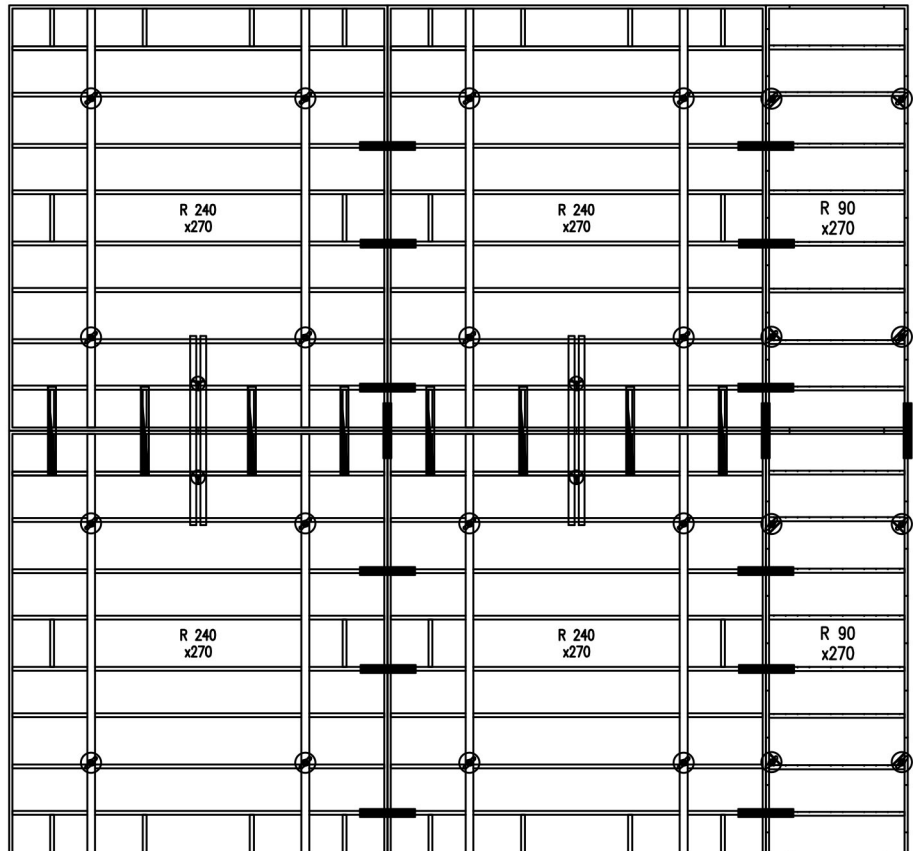
Giant Panels can provide increased formwork areas from the same number of ties and hardware.

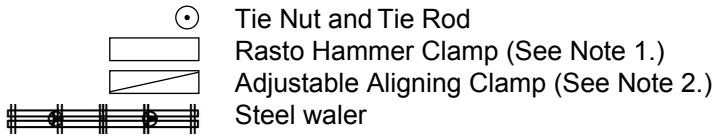


Used vertically

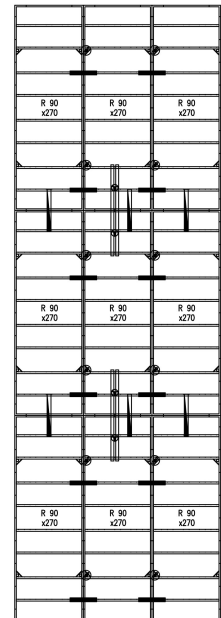
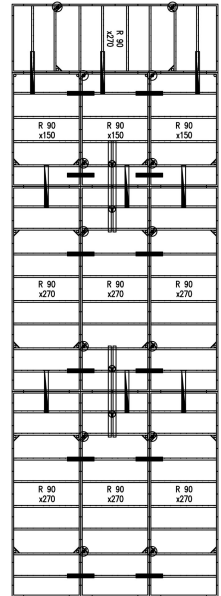
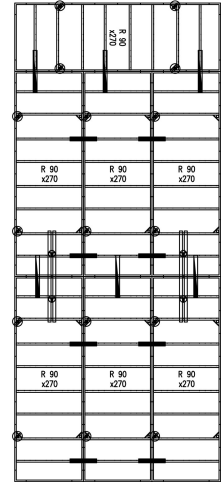
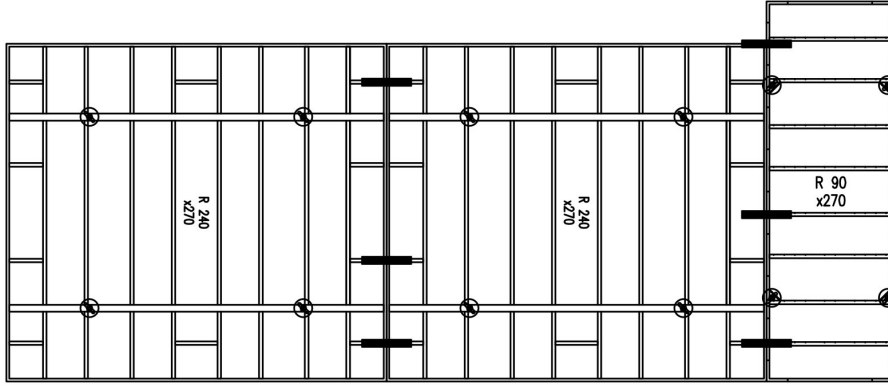


Stacked vertically

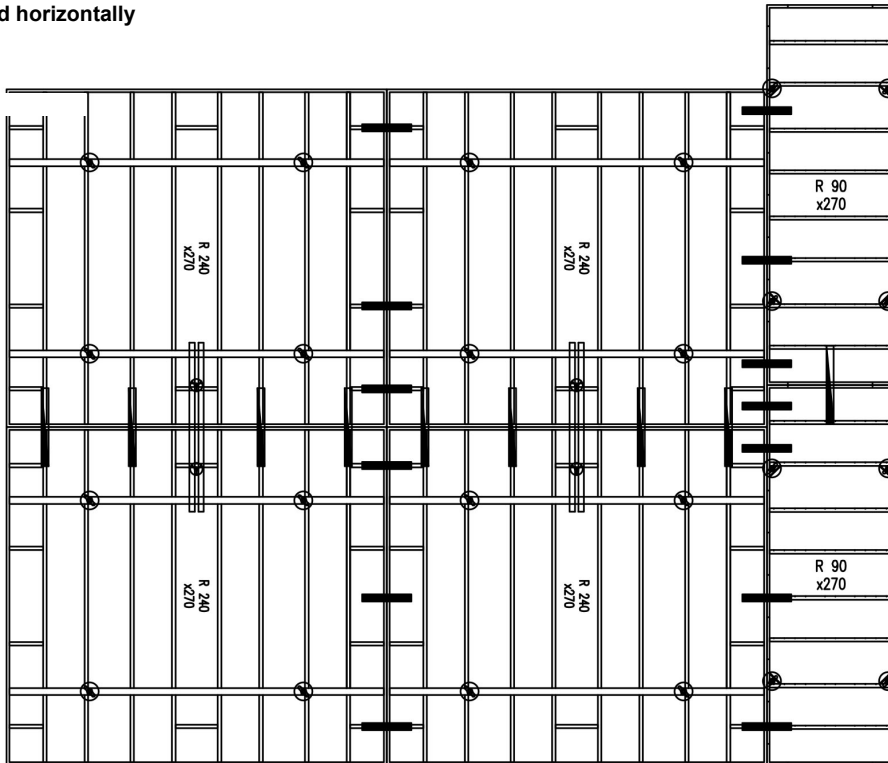




Used Horizontally



Stacked horizontally



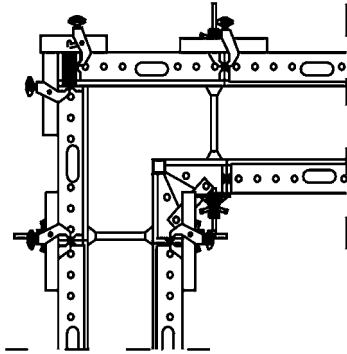
Erecting Tall Gangs

DCF Rasto has been used on countless numbers of jobs, erecting tall gangs. Our sales and engineering department will customize the correct size gang, according to jobsite requirements and conditions for efficient assembly and erection in the field. When designing the gang, DCF will use the most optimum combination of clamps and walers.

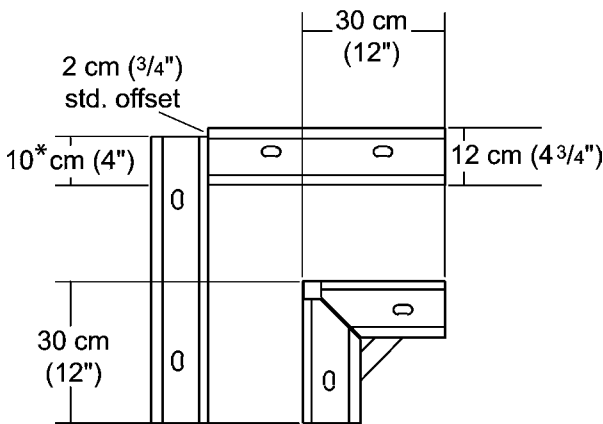
Corners

Corners are formed with two standard panels, an inside corner and outside corner clamps.

Outer corner clamps and moveable stiffeners on inside corners provide additional flexibility.



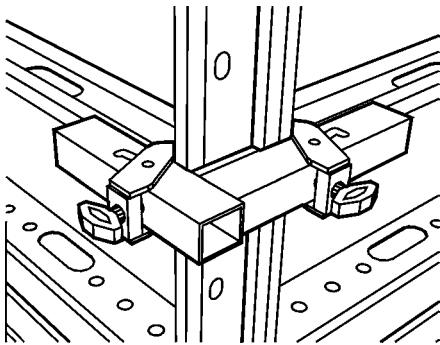
Typical Corner Configuratio



Typical Corner Dimensions

(Dimensions are nominal. See conversion chart, page 1.)

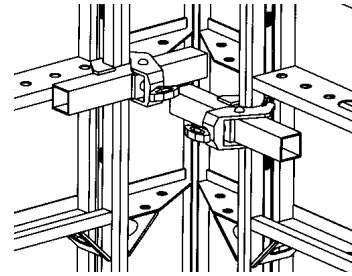
Outside Corners



Typical Outside Corner

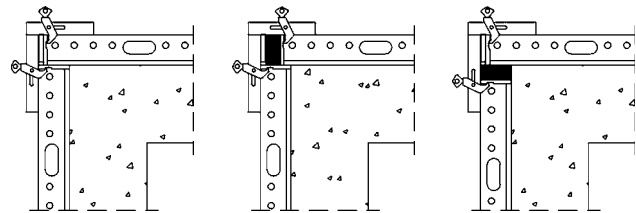
NOTE: Outside Corner Clamp straddles panel at crossmembers.

Inside Corners



Typical Inside Corner Clamp Arrangement

NOTE: Clamping inside corners at crossmembers is optional.



Position 1

Position 2

Position 3

Corner adjustments may be made to accommodate changes in wall thickness or fille requirements at a corner.

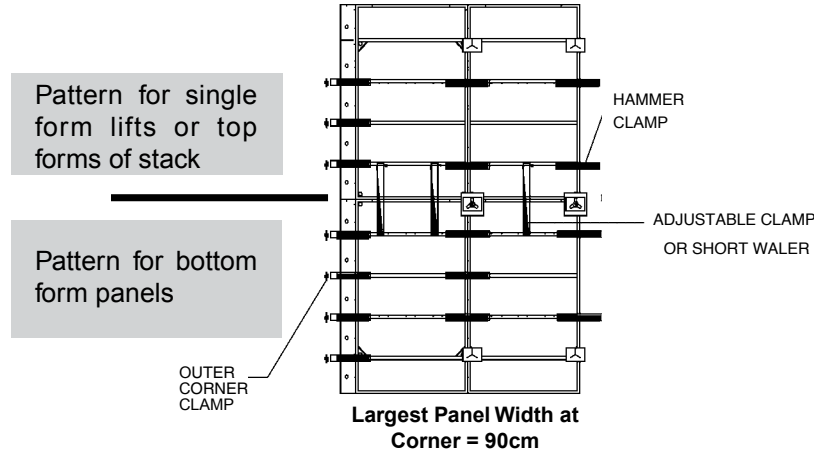
- ◆ **Position 1:** For typical outside corner conditions with no shims. The panel overlap is 4 inches.
- ◆ **Position 2:** Accommodates short block shims from 1⁵/₈" to 2³/₈". Useful for adjustments to wall thickness, to avoid filler near corners.
- ◆ **Position 3:** Same adjustment range but the shim is a continuous fille at the form face.

Clamp Requirements at Corners

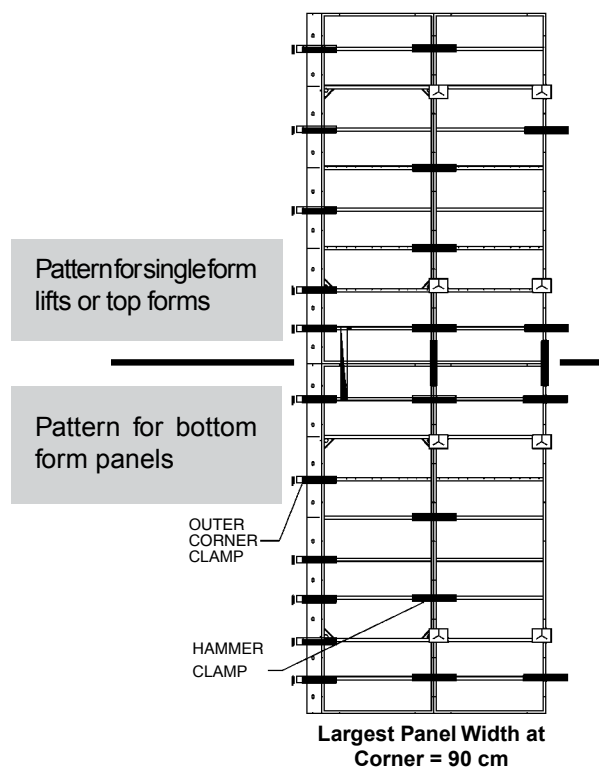
Corner clamp quantities and positions are noted below. Note additional Panel Aligning Clamps are required at the panels adjacent to the corner panels.

NOTE: Locate Outer Corner Clamp at the crossmember indicated. Install additional Adjustable Panel Clamps at horizontal panels as shown.

150 cm Forms



270 cm Forms

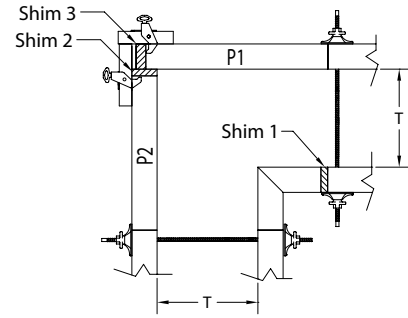


Typical Wall Details

Corner Detail with Outside Corner Clamps

T = Wall Thickness (inches)	P1 (cm)	Shim 1 (inches)	P2 (cm)	Shim 2 (inches)	Shim 3 (inches)
6	55	-	45	-	-
8	60	-	50	-	-
10	65	-	55	-	-
12	70	-	60	-	-
14	75	-	65	-	-
16	75	-	70	1/4	2 1/4
18	90	*1 5/8	75	1/4	-

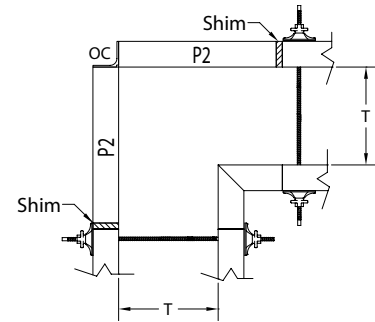
* Requires Adjustable Clamp



Corner with Outside Corners

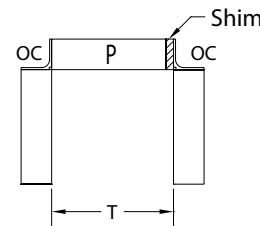
T = Wall Thickness (inches)	P (cm)	Shim (inches)
8	50	-
10	55	-
12	60	-
14	65	-
16	70	1/4
18	75	*3/4

* Requires Adjustable Clamp



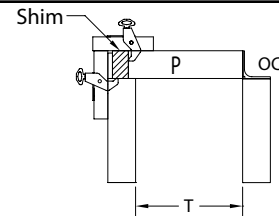
Wall End with Outside Corners

T = Wall Thickness (inches)	P (cm)	Shim (inches)	
12	30	3/16	Shim with holes drilled in
18	45	1/4	Shim with holes drilled in
20	50	5/16	Shim with holes drilled in
22	55	3/8	Shim with holes drilled in



Wall End with OC and Corner Clamp

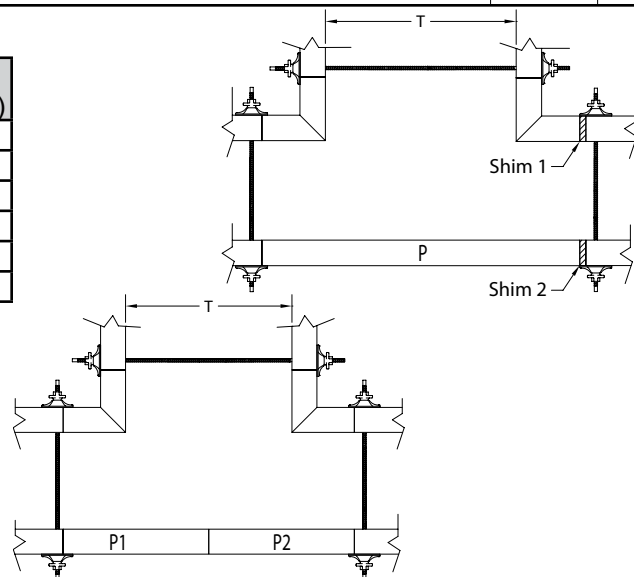
T = Wall Thickness (inches)	P (cm)	Shim (inches)
14	45	-
16	50	1/4
18	55	1/4



T-Wall Detail

T = Wall Thickness (inches)	P1 (cm)	Shim 1 (inches)	P2 (cm)	Shim 2 (inches)
6	75	-	-	-
8	75	-	-	*2
10	90	*1 13/16	-	-
12	90	-	-	-
14	45	-	50	-
16	50	-	50	-

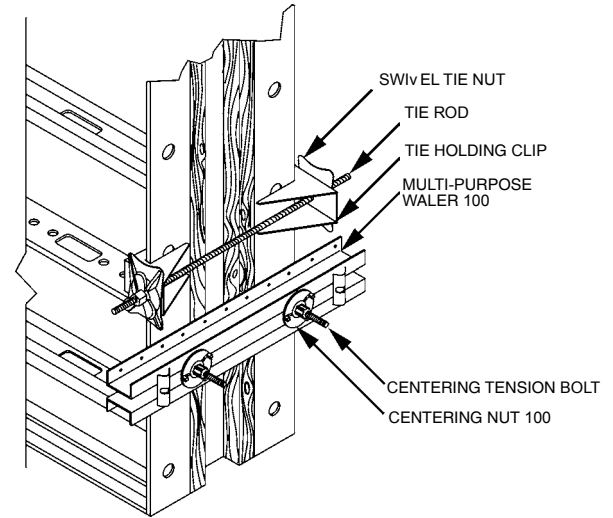
* Requires Adjustable Clamp



Bulkheads

Bulkheads are easily constructed with Multi-Purpose Walers or Adjustment Waler 120s and Centering Tension Bolts with Centering Nuts using the holes in the Rasto siderail. The walers support the bulkhead plywood and lumber (supplied by the contractor). Typically, five (5) walers are required for a single 270 cm panel height.

In addition, Tie Holding Clips can be used externally as shown. This simplifies bulkhead construction with internal panel ties. (Tie-Holding Clip capacity is 2250 lbs.)



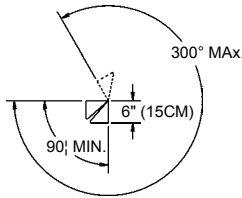
Typical Bulkhead with External Tie

Non-Perpendicular Corners

Hinged Corners

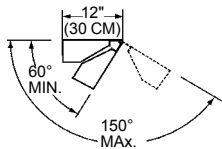
Hinged Corner 15

The Hinged Corner 15 can be used for angled corners greater than 90° as either an inner or outer corner component. It is connected to the panels by Centering Tension Bolts and Centering Nut 100s. Three bolts are required per joint on a typical 270 panel connection.



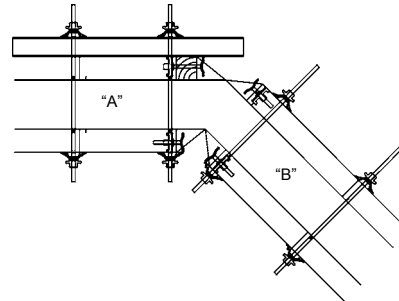
Hinged Corner 30

This Hinged Corner (with 12 inch legs) is used for intersections of walls between 60° and 150° as an inner corner. It can be mounted to the panels either by the Aligning Clamps or Centering Tension Bolts and Centering Nut. On the outside, the Hinged Corner 15 is utilized with standard panels and two walers. (See waler applications, right.)

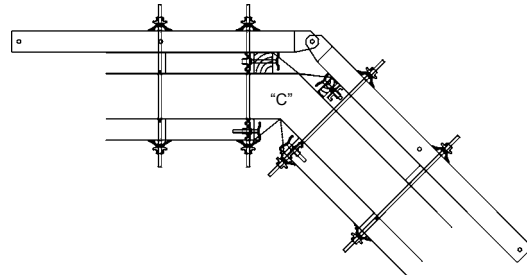


Application of Hinged Corners

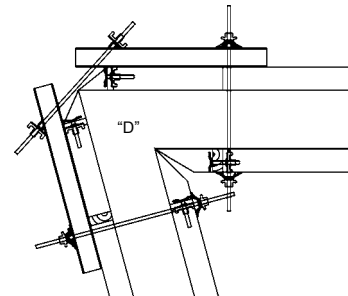
There are five tie, waler and panel configurations when forming a non-perpendicular corner.



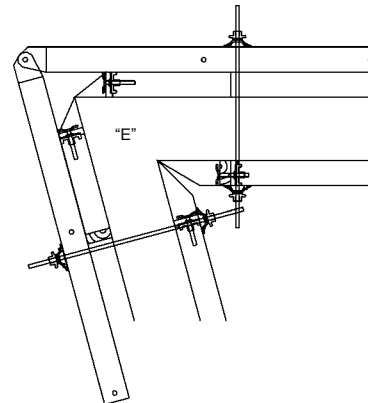
Solution "A": Standard Panels and Walers
Solution "B": MP-Panel 70



Solution "C": Hinged Waler 170



Solution "D": Multi-Purpose Waler 100

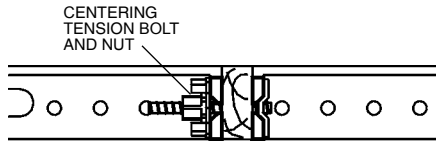


Solution "E": Hinged Waler 170

Fillers

Fillers with Tension Bolts

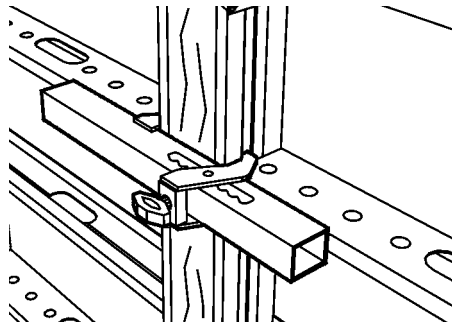
Centering Tension Bolts may be used for filler widths of 4" or less.



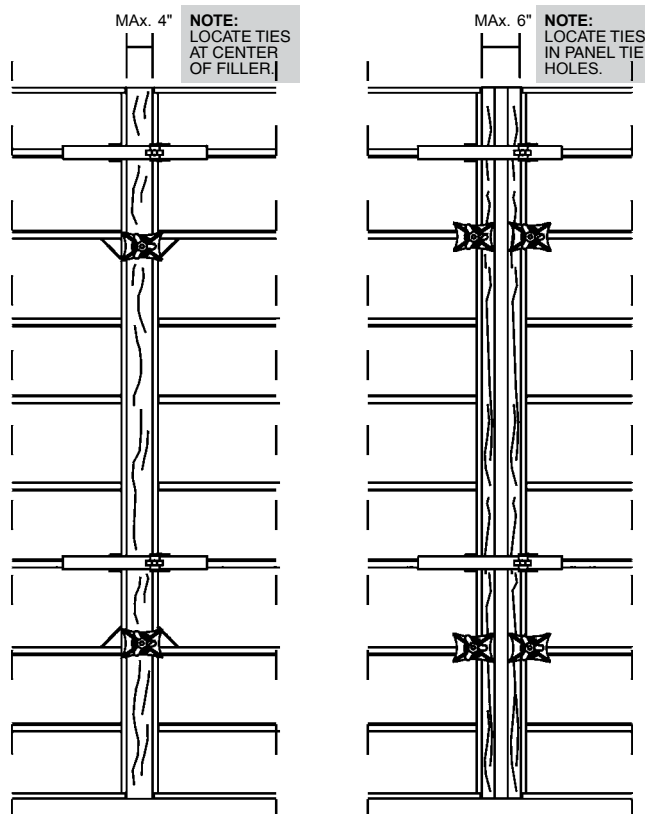
Typical Application with Solid Lumber Filler

Fillers with Adjustable Clamp

The Adjustable Aligning Clamp, which straddles panels at crossmember locations, may be used for filler widths of 6" or less.



Typical Adjustable Aligning Clamp Installation

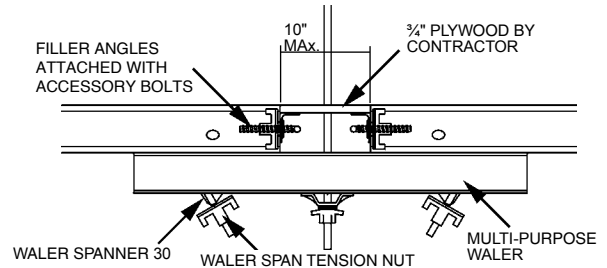


Tie Requirements for Adjustable Aligning Clamp

Fillers with Walers

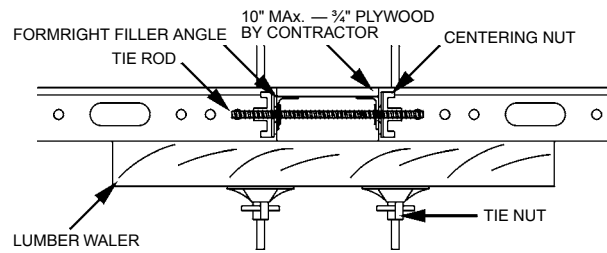
Filler areas can be created easily with Filler Angles and $\frac{3}{4}$ " plywood. Ties are inserted through the walers at normal tying heights when using a Multi-Purpose Waler 100 or an Adjustment Waler 120. (Sized 4" lumber may be substituted for the Filler Angles and Accessory Bolts.)

With the Multi-Purpose Waler 100, Waler Spanner 30, and Waler Span Tension Nut, a tension-resistant filler alignment is made. Accessory Bolts are required approximately 2' O.C. per 270 cm panel connection.



Typical Connection with Multi-Purpose Waler

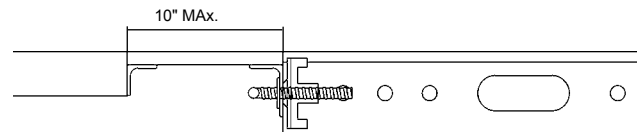
When Adjustment Walers 120 or lumber are used for aligning the panels, the tension-resistant connection is made using Tie Rods and two Centering Nuts. This configuration requires three (3) connections per 270 Panel.



Typical Connection with Lumber Waler

Transition Fillers

Filler Angles allow transitions to other forming systems through $\frac{3}{4}$ " plywood. In some cases, the contractor may need to provide a tension-resistant connection from Rasto to the other forming system.



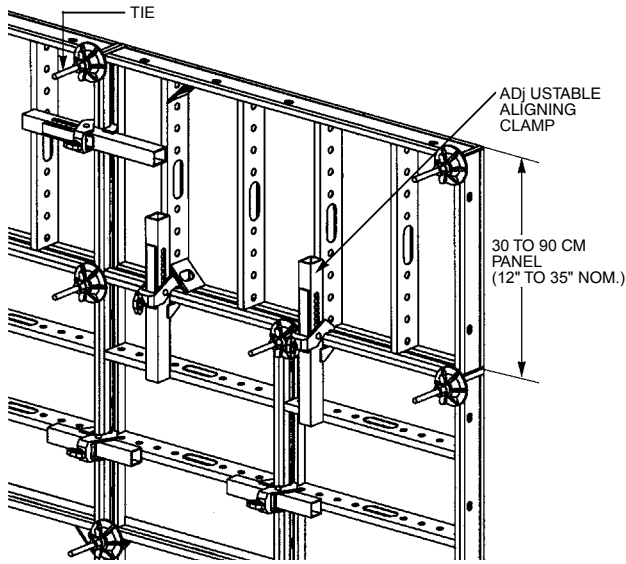
Filler Angles and Plywood Transitioning Between Form Systems

Height Adjustments

Adjustments with Panels

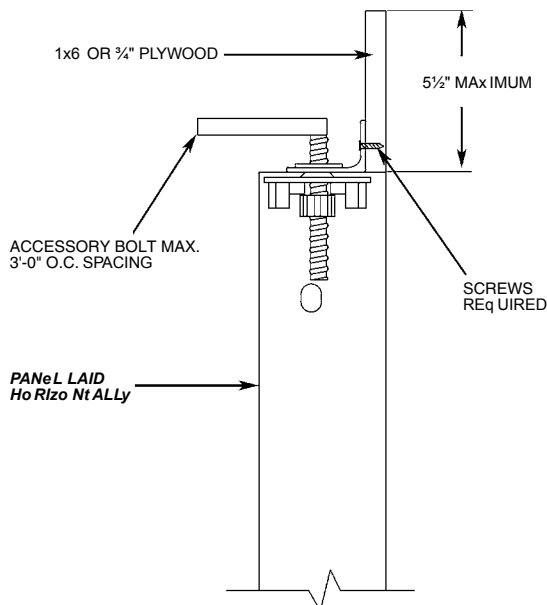
Standard panels, laid horizontally, provide height adjustments in approximately 6" increments. Adjustable aligning clamps and top ties are required.

NOTE: Height adjustments can be made by combining various sized panels. Pre-planning ensures proper alignment of joints.



Typical Height Adjustment with Horizontal Panel

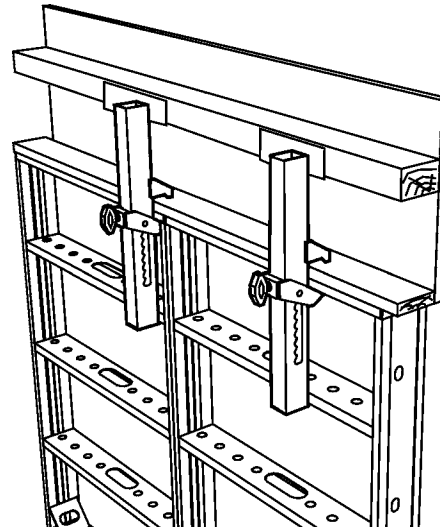
NOTE: Small additional extensions may be added to the top of panels laid horizontally using Rasto Filler Angles.



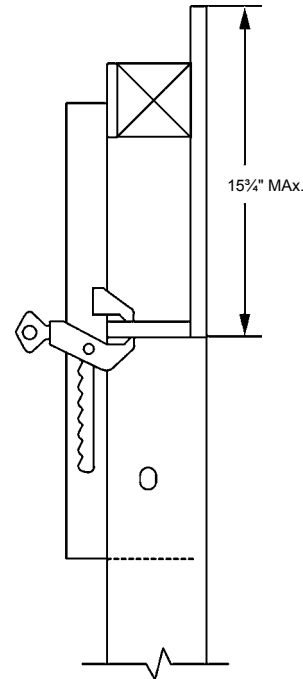
Height Adjustment with Plywood on top of Horizontal Panel

Extensions Using Plywood

Formwork can be extended up to 15³/₄" above the panel edge. Construction consists of ³/₄" plywood backed by lumber with a ¹/₂" shim at the adjustable clamp location. Spacing varies with concrete depth and lumber sizes used and must be designed by a qualified form designer. Typical clamp spacing is approximately 3'0" on center.



Typical Form Height Extension



Form Height Extension Section Detail

Columns

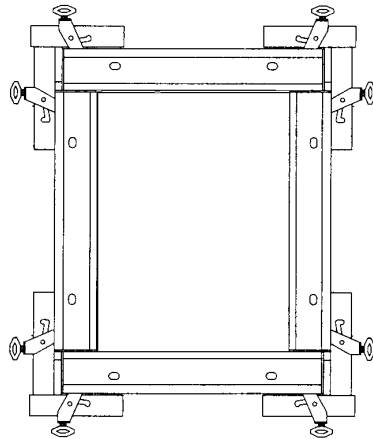
Rasto 1250 psf capacity is ideal for column applications. Outer Corner Clamps, Outside Conversion Corners, and Column Hinges provide column forming solutions to accommodate almost any requirement.

Columns with Outside Corner Clamps

Panels Arranged in Pairs with Shims

Columns may be constructed using standard panels and Corner Clamps. When U.S. dimensions are required, columns may be shimmed at the clamps or lined with plywood.

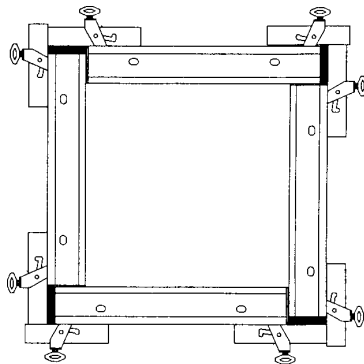
Outside Corner Clamps allow shims from 1⁵/₈" to 2³/₈" to compensate for forming columns in U.S. dimensions (feet and inches).



Configuration
Panels Arranged in Pairs

Panels Arranged in a Pinwheel

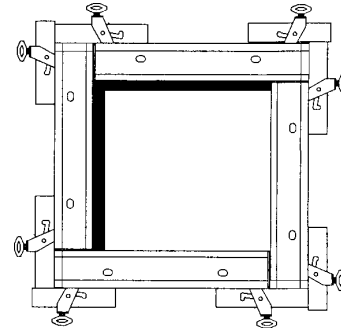
Four 45 cm panels may be combined with 1⁵/₈" shims at each corner to form a 16" square column.



Configuration
Panels Arranged in Pinwheel

Panels Arranged in Pairs with Plywood

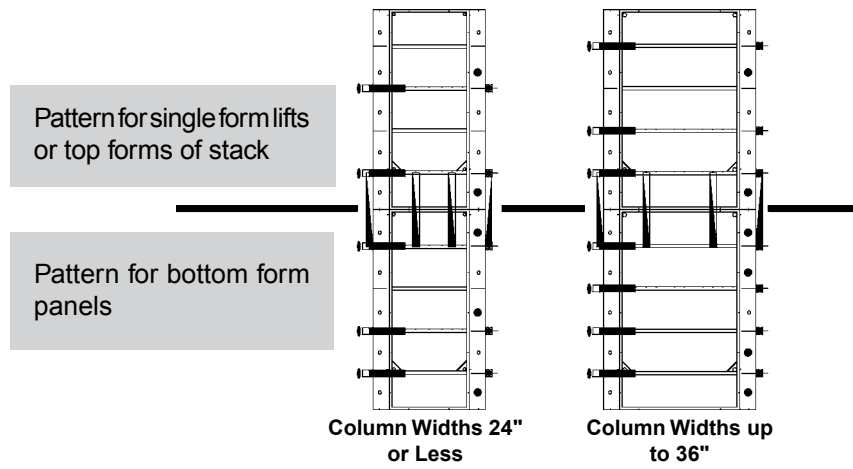
Adding a 3/4" plywood sheet face of adjacent panels co-verts a 45 cm square column to a 13" square column.



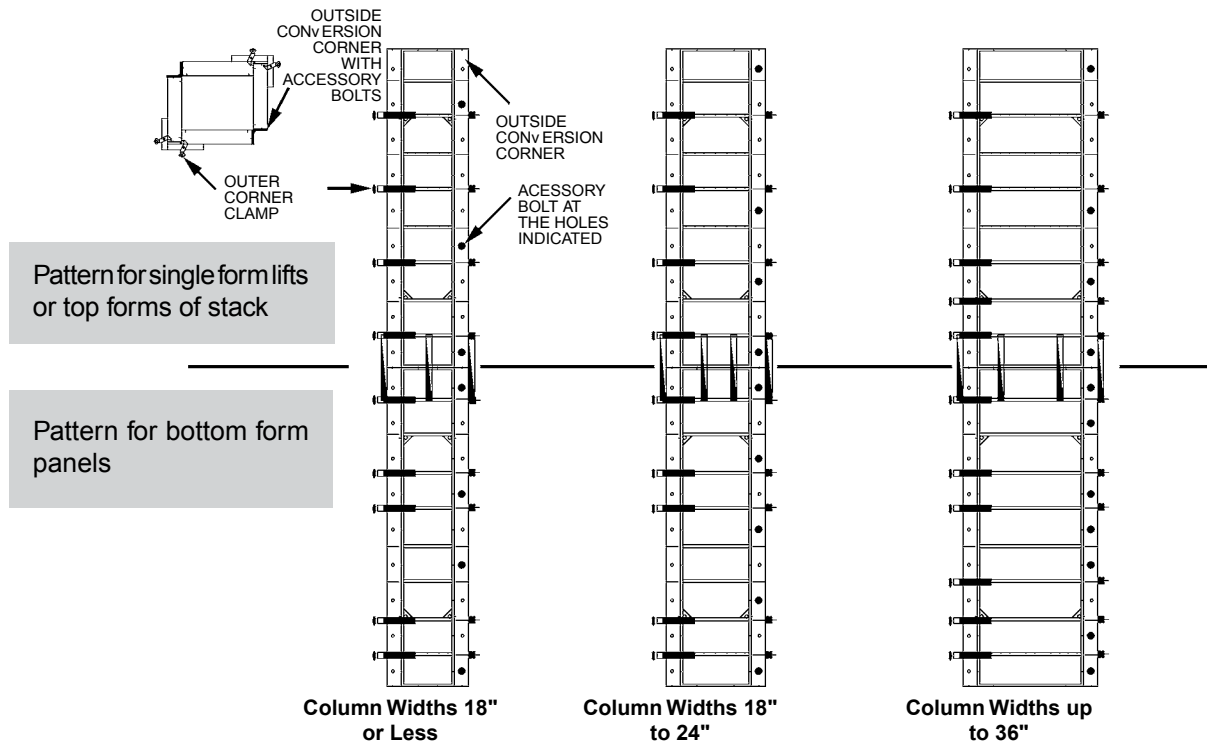
Configuration 3
Panels Arranged in Pairs with Plywood

Bolt and Clamp Placement

150 cm Form Accessory Bolt and outer Corner Clamp Placement



270 cm Form Accessory Bolt and outer Corner Clamp Placement



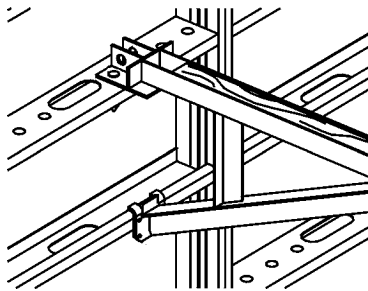
Walkways

Walkway Brackets

Rasto Walkway Brackets will support an allowable load of 25psf at a maximum spacing of 6'0". Brackets are attached to the holes in the panel cross-members when the panel is in either the upright or horizontal position. (See illustrations below.) A Guardrail Post is inserted into a socket at the end of the bracket and lumber top, and midrails are attached along with toeboards.

Upright Panel Attachment

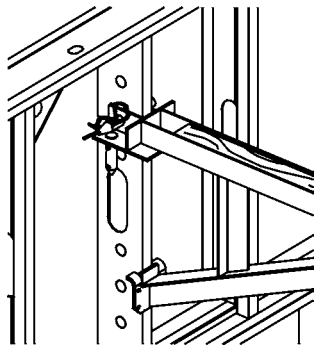
When used with upright panels, the Walkway Bracket's upper prongs are inserted in the holes in the cross members and secured with the attached Spring Pin.



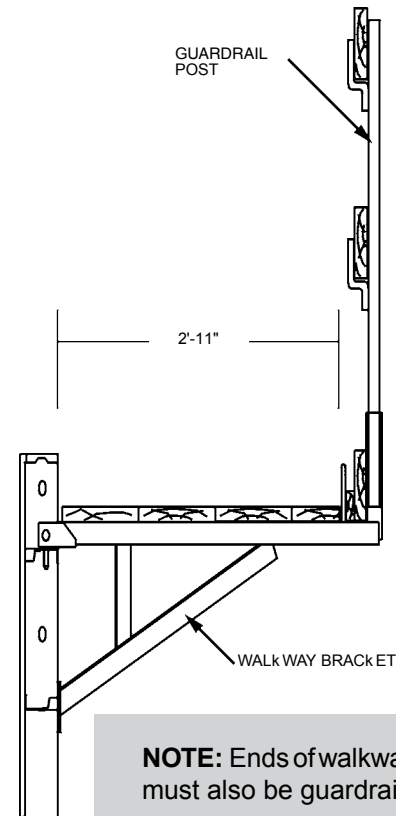
Walkway Bracket Attachment to Vertical Panel

Horizontal Panel Attachment

When used with horizontal panels, the Walkway Bracket is secured with a Shoring Rivet and Hitch Pin.



Walkway Bracket Attachment to Horizontal Panel



NOTE: Ends of walkway runs must also be guardrailed.

Typical Guardrail Application

Other Safety Notes

Nail strips are provided in the Walkway Brackets for attaching planking. Wood planks must be graded as scaffold plank by an approved grading agency. Refer to OSHA regulations.

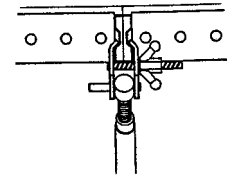
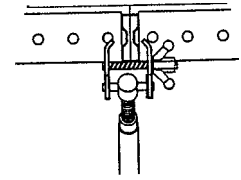
Access to the Walkway Bracket platform must be provided in accordance with applicable local, state, provincial or Federal OSHA regulations. **Do not climb crossmembers to access platform.**

In addition to Walkway Brackets, the holes in Rasto panels may be used for attaching positioning devices for temporary positioning during assembly and disassembly of formwork.

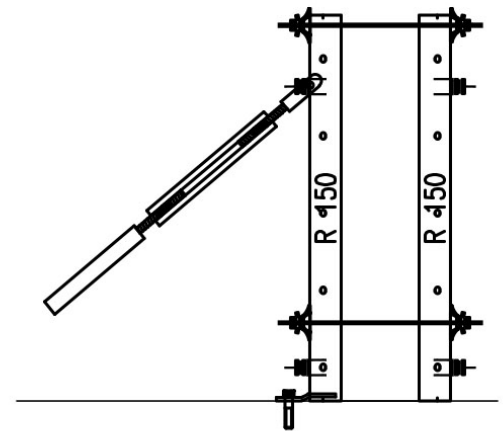
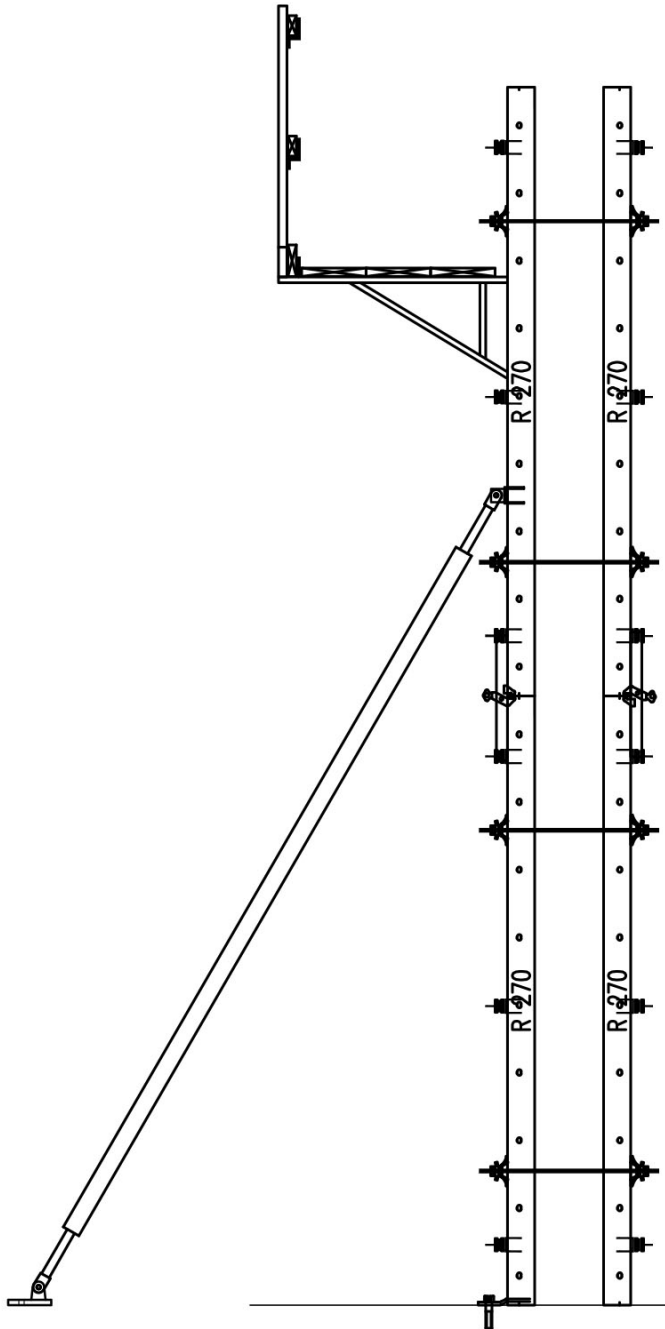
Safety goggles, hardhats, gloves and steel-toed shoes should be worn as recommended by state or Federal OSHA regulations.

Aligning Formwork Pipe Braces

DCF recommends using B1, B4 and/or B5 pipe braces on 6' centers in most applications. We also recommend a footing clip or anchor directly to the form also on 6' centers. We require bracing and anchoring on one side only. The amount of bracing will depend on form height application.



New Connection with Gripping Plate



For short wall applications, a standard turnbuckle brace can be used (supplied by DCF). A panel bolt and nut connects the turnbuckle to the panel.

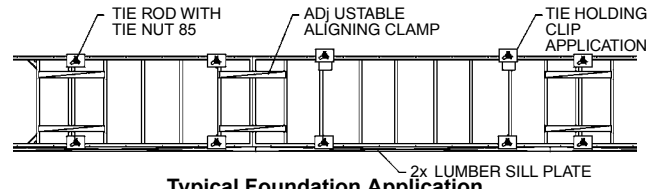
Other Tying Considerations

Foundation Formwork

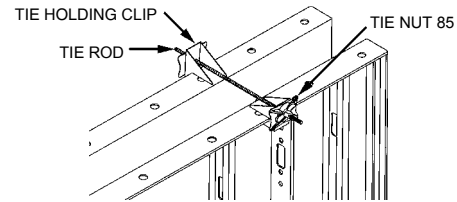
Foundation formwork can be set up by using a panel laid horizontally. A lumber sill is required in order to attach a Tie Nut 85 to the lower Tie Rod edge. Adjustable Aligning Clamps are required.

Tie Holding Clips can be used along the top edge of the panels instead of tying through the panels.

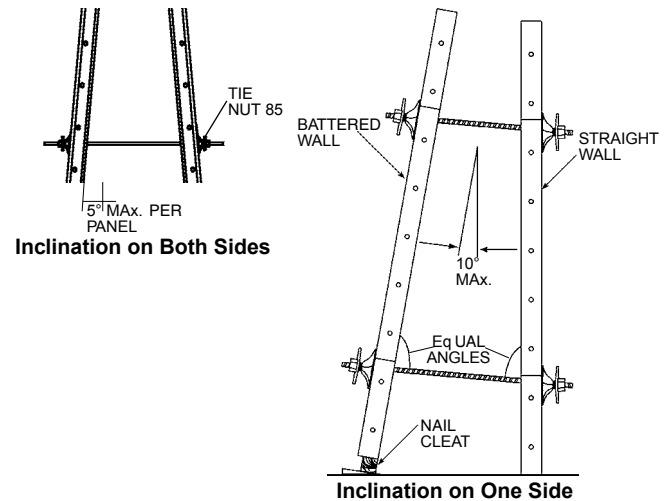
Tie-holding clip capacity is 2250 lbs.



Typical Foundation Application



Typical Top Tie Application



Inclination on Both Sides

Inclination on One Side

Battered Walls

Battered walls of up to approximately 10° total inclination on both sides or up to 5° on one side may be formed with tie rods. This is equivalent to a difference of approximately 19" in wall thickness for a height of 8'-10" (270 cm panel). A swivel tie nut, such as the Tie Nut 85, is required in these cases.

Single-sided Batters

When only one side of the wall is battered, the panel should be raised with a built-up sill. This sill should be constructed to equalize the angle between the tie and the form face.

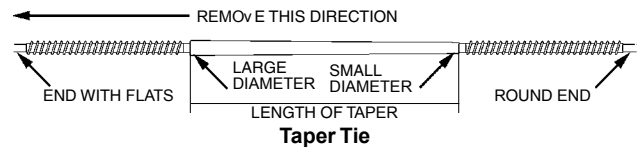
Taper Ties and She Bolts

Taper Ties

Safe working load is 18,750 lbs. at a 2:1 Safety Factor.

Taper Ties have 15 mm thread to fit all standard tie nuts and are titled by length of taper as follows:

Tie	Length	Wall Thickness
Taper Tie 16	41"	7" to 16"
Taper Tie 24	49"	15" to 24"



Taper Tie

IMPORTANT:

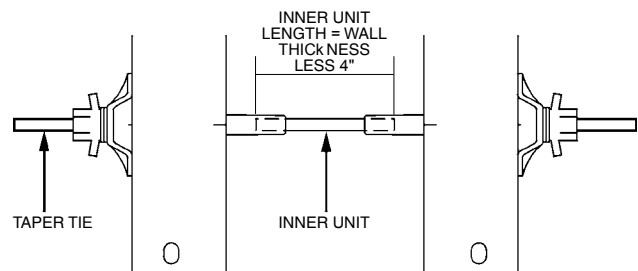
Note taper direction for setting and stripping.

She Bolts

Safe working load is 18,000 lbs. at a 2:1 Safety Factor.

She Bolts with 15mm threaded inner unit are another tying option.

Use only round DCR bar-type Inner Units to avoid concrete build-up in the nose of the She Bolt.

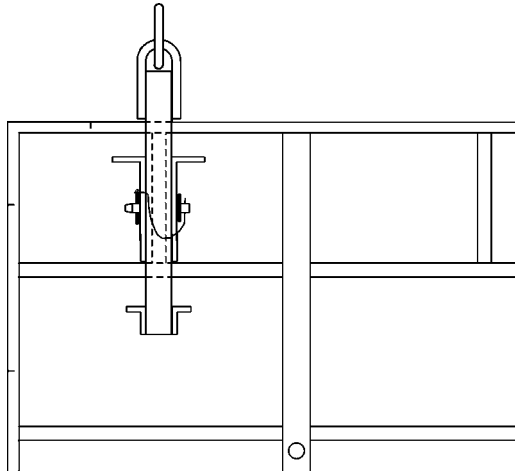


Typical She-Bolt Application

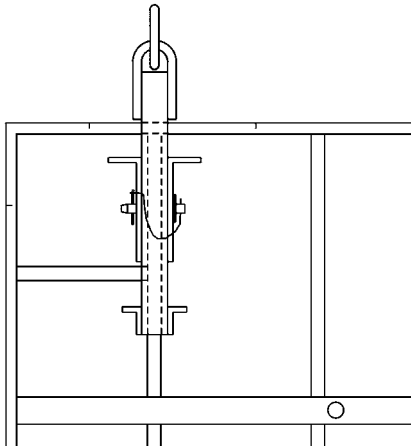
CAUTION: Do not use with bent Inner Units

240x270 Giant Panels

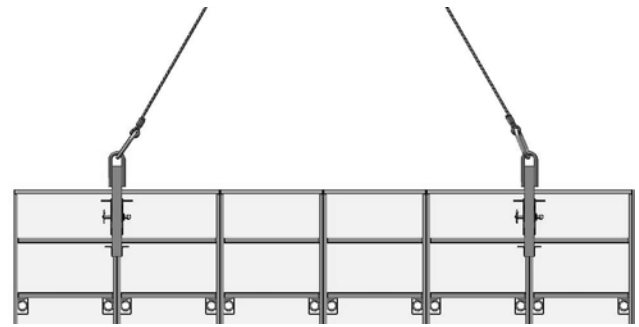
Giant panels may be lifted with either the RTL Brackets located at the end or side rails, or at the first stiffener in.



Panel Lift Bracket
Connection for Giant Panels
Running *vertically*



Panel Lift Bracket
Connection for Giant Panels
Running *horizontally*



Typical 2-Point Gang Lift



240 Wide Extension Panels

Extension panels may be lifted with either the RTL Brackets located at the end or side rails, or at the first stiffener in.

The standard lifting lug can be placed anywhere along the top rail and side rail of any panel. Due to the limitations of the side/top rail, the standard lifting lug is only recommended on single lift gangs or gangs no taller than a 270 cm + 150 cm stack up.

