#9 A/L HEAVY DUTY FORMING SYSTEM

The GATES #9 Anchor-Lock System uses 3/4" plywood with the 4 x 4 walers on 12" centers, crossed by additional 4 x 4 double strongbacks on 36" centers to minimize the unsupported span. GATES #9 Anchor-Locks are spaced 3'-0" x 3'-0" (9 sq. ft. max per tie).

Advantages of Gang Forming:
- Lower construction costs
- No loose hardware
- Gang form both sides
- Pass-thru form ties

GATES #9 Anchor-Lock
(Open & close with carpenters hammer)

GATES Taper Tie
(Plated, very smooth)
The GATES Heavy-Duty #9

Anchor-Lock gang form system is in a class by itself:

1) Provides 3'-0" x 3'-0" tie spacing.
2) Uses horizontal 4 x 4 walers, double 4 x 4 vertical strongbacks and 3/4" BB Grade or plastic-faced plywood...no expensive steel or aluminum backup members.
3) 3/4" Plywood provides added insulation to the concrete, summer or winter.
4) Easy to job-build with carpenter labor.
5) Easy to add or modify on the job.
6) Light in weight...8-10 lbs./sq. ft.

SAFETY REQUIREMENT:

You must add cross bolts above the Pick-Up Loop bolt as a safety precaution.

Four (4) safety bolt connections.

A secondary strap from the bottom of the Pick-Up Loop down with one additional bottom bolt must be used.

Designed working load not to exceed 2000 lbs. with a four-to-one safety factor.

GATES PICK-UP LOOP

Strongback and tie spacings can be adjusted to fit job requirements, but never should a lock and tie support more than 9 sq. ft. of form. By spacing the Anchor-Locks 3'-0" along the vertical strongbacks, a tie pattern of approximately 3'-0" x 3'-0" is obtained. Multiple holes in the face of the Anchor-Lock plate allow for easy lock alignment over the tie holes with the lag screws.

GATES #9 ANCHOR-LOCK GANG FORM

(3'-0" x 3'-0" Tie Spacing, With No Loose Hardware!)
The 2" x 3" radius steel rail is perforated with 7/16" holes for 3/8" bolts or 3/8" lag screws on 1" centers. The radius rails may be bolted to the form with 3/8" x 8" flat head bolts (through face of plywood) or may be lagged to the vertical 4 x 4s on the back side of the form with 3/8" x 6-1/2" lag screws. The GATES #9 Side-Lock is attached to the box rail on approximately 3'-0" centers and is designed to provide a 1/2" movement along the rail for easy alignment of form ties. Tie spacing should always be held to about 3'x 3' so that you never exceed more than 9 sq. ft. per tie.

Plywood Bending Table

- 20'-0" Dia. 3 pcs. 1/4"
- 30'-0" Dia. 2 pcs. 3/8"
- 40'-0" Dia. 2 pcs. 3/8"
- 50'-0" Dia. 1 pc. 5/8"
- 60'-0" Dia. 1 pc. 3/4"
- And Larger

**TYPICAL FORM TIE COMBINATIONS**

**GATES One-Piece Taper Tie -**

20,000 #

Has a smooth, plated taper so it can be easily withdrawn for repeated use without rusting and slotted ends to accommodate various concrete wall thicknesses depending on your project.

**GATES Type ‘A’ Tie End -**

18,000 #

Standard 1' diameter Type ‘A’ Ends with 1/2" x 13 N.C. threads for 1/2" inner ties. Tie ends are tapered for easy insertion and removal through a 1 1/16" or 1 1/8" tie hole in the form plywood. Plated to resist rust.

**GATES Type ‘B’ Tie End -**

18,000 #

GATES Type ‘B’ Ends with a pull through tie rod through plastic sleeve. Grease inner tie rod. Plastic sleeve inside dia. = 9/16" outside dia. = 3/4". Plated to resist rust.

**GATES Type ‘C’ Reattaching Tie End**

18,000 #

Threaded tie end for re-attaching forms to previously placed concrete walls. Plated to resist rust.

**GATES 1/2” Inner Tie -**

18,000 #

1/2" diameter Inner Tie with 1" of thread on each end. Flat anchor near center.

**GATES 1/2” Inner Tie -**

18,000 #

1/2" diameter Inner Tie with neoprene waterseal.
#9 SIDE LOCKS WITH VERTICAL 4 x 4s AND PERFORATED BOX TUBE -

2” x 3” Perforated steel box tube with the GATES #9 Side Lock attached provides a strong form without loose hardware. For easy tie insertion, the Side Lock is designed for 3/4” movement along the box rail over each tie location.

The vertical tubing may be attached with 3/8” x 6-1/2” lag bolts or 3/8” x 8” flat head bolts from the face side of the form. Plywood should be attached to the horizontal 4 x 4 walers with lathers drive screws, ring shank nails or galvanized nails.

Pick-up Loop attaches with two 3/8” x 3-1/2” machine bolts and lock nuts.

Attach box tube to walers with 3/8” x 6 1/2” lag bolt. Pull out strength of 3/8” lag from fir = 800 lbs. per inch of penetration.

VERTICAL BOX TUBE STRONGBACK WITH GATES #9 SIDE-LOCKS (PLATED - TUBES AND LOCKS)

USE OF GATES ‘U’ CLAMP TO CONNECT FORMS

2” x 2” Angle 2” x 3” Angle GATES ‘U’ Clamp

2” x 2” or 2” x 3” Angles are bolted with flat head bolts at each end of the gang form. Bolt angles to plywood on 12” centers - closer on outside corners.

GATES ‘U’ Clamp is ideal for locking angles and outside corner angles. Tight locking that is safe, secure and easy to use.

A 6 1/4” x 6 1/4” x 3/16” angle is attached to the 2” x 3” x 3/16” angles bolted to the end of each gang form. ‘U’ Clamps spaced on 1'-0” centers quickly attach the two forms to the larger outside angle, securely locking the corner together.

‘U’ CLAMPS ARE PLATED TO RESIST RUST
INSIDE AND OUTSIDE CORNERS

GATES PIN’N LOCK
OUTSIDE CORNER

Now you can have LEAK-PROOF corners by using GATES adjustable Pin’N Lock heavy duty, outside steel corners, with no loose parts.

GATES FLEX-STEEL INSIDE BREAK-AWAY CORNER

For elevator or stair shaft gang form use, provides 5/8” clearance on each side at all four corners. To retract, loosen all bolts on vertical cross bars spaced on 24” centers using a speed wrench. Rotate turnbuckles in unison, drawing forms away from new concrete walls. Lift gang forms and reset.

GATES HEAVY-DUTY INSIDE BREAK-AWAY CORNER

GATES INSIDE BREAK-AWAY CORNER (Top view, retracted)

GATES Pin’N Lock
Outside Corner
- Fast acting claw
- Strong connection
- Allows for adjustment
- No loose parts
- Open and close with a carpenters hammer
- Roll pin prevents coil rod from falling loose.

GATES PIN’N LOCK
(Top View)
Bolt outside corner units to corner of gangs. Position as shown in this top view.

#9 Anchor-Lock

Type ‘A’ Tie End
(Plated)

Dbl. 4 x 4 strongbacks

4 x 4 Waler at 12” O.C.

4 x 4 Lumber

1/8” Rabbet

INSIDE BREAK-AWAY CORNER

1/2” Inner Tie

3/4” Plywood

5/16” x 1-1/2” Flathead bolt at 6” O.C. staggered

H.D. Metal Break-Away Corner

‘U’ Clamps

GATES INSIDE BREAK-AWAY CORNER

Poured concrete

Tie ends removed

Tie end is removed before form is removed

GATES HEAVY-DUTY INSIDE BREAK-AWAY CORNER

#9 Anchor-Lock

Type ‘A’ Tie End
(Plated)

Dbl. 4 x 4 strongbacks

4 x 4 Waler at 12” O.C.

GATES FLEX-STEEL INSIDE BREAK-AWAY CORNER

1/8” Rabbet
The GATES Anchor-Lock gang form may be assembled using 3/8" x 8-1/2" flat-head bolts. The bolt should penetrate the face of the plywood form, the horizontal 4 x 4 waler and the vertical strongback.

A second method of attaching strongbacks to the horizontal walers is the use of a 3/8" x 6" lag screw with 3-1/2" x 3-1/2" lumber. On any member that is to become a pick-up point, additional bolts or lag screws must be used. Pull-out strength of 3/8" lag is 800 lbs. per inch of penetration.

**STEP #1:**
**BUILD TEMPLATE (JIG TABLE)**

Blocking to position 4 x 4 double strongbacks

Nail blocking lightly so they may be moved in or out for different length gang forms.

Template should be built high enough above the ground so that the carpenters may work under the gang to tighten bolts.

After the jig table is built, diagonal braces should be added to keep it perfectly square throughout the building of all gang forms.

3/4" Plywood cleats or 2 x 4 blocking to position the 4 x 4 walers.

Template (Jig Table) must be built square, level & sturdy to support gang form.
**STEP #2:**
**POSITIONING OF 4 x 4 STRONGBACKS AND 4 x 4 WALERS**

After template is built, 4 x 4 strongbacks and 4 x 4 walers are cut to required length and placed between 4 x 4 and 2 x 4 blocking as shown.

4 x 4 Strongbacks are placed on 36" centers 12" in from each end. They are then crossed by horizontal 4 x 4s on 12" centers from top to bottom of the gang form. Tie spacing must never exceed 9 square feet per tie.

**3'-0" x 3'-0"**
**Tie spacing**

Drill 1 1/8" tie hole through panel for ties.

**Be certain form is square before fastening plywood.**

**STEPS #3 & #4:**
**BUILDING GANGS & DRILLING OF FORMS**

When attaching 4 x 4 vertical strongbacks that will be used for picking, attach to gang with 3/8" diameter bolt. Bolt through panels, walers and strongbacks.

When all 4 x 4 walers are set in place on template, place 3/4" plywood panels over 4 x 4 walers and nail to walers with drywall screws.

Hold horizontal 4 x 4 back 2-1/4" from each end of form for vertical 2" x 2" connecting angles. Attach vertical 2" x 2" angles back of plywood edge 0"-1/32". Bolt angle on 12" centers.

2" x 2" x 3/16" Angle may be attached to form while still on template for gang connections. Hold angles in place with a 'C' clamp while bolting.
USE THESE HORIZONTAL SPACINGS WITH VERTICAL SPACINGS SHOWN BELOW AT A RATE OF POUR OF 6'-0" PER HOUR AT 70° F.

The engineered drawings on these two pages provide you with the correct horizontal spacing of the walers and the vertical strongbacks. Three typical widths of gang form panels, 8'-0", 12'-0" and 16'-0" wide are shown to the left. Gang form heights from 8'-0" to 24'-0" high are shown below.

Select the gang form width that suits your job - then select the gang form height closest to your concrete wall height. The gang form width and the gang form height will establish your form tie locations. Ex: An 8'-0" wide gang form is best suited for your job. The vertical strongback spacing is 1'-0" from each end and all other equal spaces are 3'-0".

A 16'-0" high gang form is closest to your wall height. The tie spacing from bottom to top on a 16'-0" high gang form is 8", 2'-8", 3'-0", 3'-0", 3'-0" and 8". Establish your ties and locks accordingly.
USE OF GATES ‘U’CLAMP TO CONNECT FORMS

TUBE STRONGBACK FORMS AND ATTACHMENT

#9 SIDE LOCKS WITH VERTICAL 4 x 4s AND PERFORATED BOX TUBE-

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GATES ‘U’Clamp is ideal for locking angles and outside corner angles. Tight locking that is safe, secure and easy to use.

2" x 2" or 2" x 3" Angles are bolted with flat head bolts at each end of the gang form. Bolt angles to plywood on 12" centers - closer on outside corners.

A 6 1/4" x 6 1/4" x 3/16" angle is attached to the 2" x 3" x 3/16" angles bolted to the end of each gang form. ‘U’Clamps spaced on 1'-0" centers quickly attach the two forms to the larger outside angle, securely locking the corner together.

LIQUID HEAD is the maximum height of liquid concrete for a given rise per hour of concrete in the forms.

Example...
At a pour of 6'-0" per hour at 70º F, the pressure on the forms will be 900 pounds per square foot.
The 2” x 3” radius steel rail is perforated with 7/16” holes for 3/8” bolts or 3/8” lag screws on 1” centers.

- The radius rails may be bolted to the form with 3/8” x 8” flat head bolts (through face of plywood) or may be lagged to the vertical 4 x 4s on the back side of the form with 3/8” x 6-1/2” lag screws.

- The GATES #9 Side-Lock is attached to the box rail on approximately 3'-0” centers and is designed to provide a 1/2” movement along the rail for easy alignment of form ties.

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<table>
<thead>
<tr>
<th>Plywood Bending Table</th>
<th>20'-0” Dia</th>
<th>3 pcs.</th>
<th>1/4”</th>
</tr>
</thead>
<tbody>
<tr>
<td>30'-0” Dia</td>
<td>2 pcs.</td>
<td>3/8”</td>
<td></td>
</tr>
<tr>
<td>40'-0” Dia</td>
<td>2 pcs.</td>
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</tr>
<tr>
<td>50'-0” Dia</td>
<td>1 pc.</td>
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<td>And Larger</td>
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</tbody>
</table>

GATES Adjuster

Adjustable points may be added to each radius rail at several points to change radius.

Contact GATES for the proper form design on your next radius wall project.

Place 4 x 4 vertical waler over joint in plywood. Attach plywood to 4 x 4 with nails or drywall screws.

Each end of radius steel waler must be securely fastened as close to end of gang form as possible.

- Use vertical 4 x 4s with 2” x 3” rolled radius walers from GATES.

GATES ADJUSTABLE RADIUS WALL GANG FORMS
CLOSED ELEVATOR / STAIR SHAFT
GATES Lift’N Lock Safety Platform provides a safe working surface [for workers only, not designed for material or tool storage] when used with GATES #9 Anchor-Lock system. Gang form and safety platform should be lifted together. A weighted tongue moves back out of pocket and automatically enters pocket above (see below). The GATES Lift’N Lock Platform may be used to brace gang forms when properly constructed with L.V.L. beams and a sturdy plywood deck securely bolted together. (Not advised if high-wind conditions should occur.)

Platform LOCKED in place:
- Latch rotates into pocket at next work level.
- Bearing plate (built into pocket) distributes load to concrete.
- Before platform is released from crane, all safety bolts must be in place.
- Form pushing devices to align form.

Platform in LIFT position:
- Remove safety bolts before raising platform.
- Platform is chained to bottom of gang form and trails the collapsed form as it is lifted.
- Latch rotates back into bracket as platform is lifted, and back into pocket at next work level.
- Thru-bolt
- Platform hangs from bottom of form.

See GATES Lift’N Lock Platform literature for details on proper use. Contact Gates & Sons, Inc. for help designing Lift’N Lock Platforms.

Maximum Load per Bracket
2250 Lbs. (SF = 4.1)
To include form weight, platform dead load and minimum 25 Psf platform live load.

LIFT’N LOCK PLATFORM WITH #9 ANCHOR-LOCK

OPEN ELEVATOR / STAIR SHAFT

Platform LOCKED in place:
- Latch rotates into pocket at next work level.
- Bearing plate (built into pocket) distributes load to concrete.
- Before platform is released from crane, all safety bolts must be in place.
- Form pushing devices to align form.

This drawing shows a typical use. Every job needs to be designed for its specific use and jobsite conditions.

Lift’N Lock Bracket

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