

Installation Manual

For Franchised/Licensed Plants of
Superior Walls of America, Ltd.
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MAN 42-9008 (07-20-2011)



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Pre-Installation Jobsite Inspection Checklist - SWA DOC 42-2363
Superior Walls® Repair Report - SWA DOC 42-2366
Superior Walls Installation Inspection Form - SWA DOC 42-2371

OSHA Fact Sheet - Signal Person Qualification (DOC 10/2010)
OSHA Fact Sheet - Qualified Rigger (DOC 10/2010)

INTRODUCTION

DISCLAIMER



The safety recitals contained in this manual only constitute the recommendations of Superior Walls of America, Ltd. regarding the safe operation of your franchised/licensed plant. Superior Walls of America, Ltd. makes no representation that by following these recommendations licensees will be in compliance with federal, state or municipal ordinances. Licensees are solely responsible for the safe operation of their facility/company and must consult with their own attorneys to determine applicable safety compliance requirements.

This manual describes step-by-step procedures for installing Superior Walls panels on sites that are properly prepared according to requirements outlined in the Builder Guideline Booklet™ (BGB). It is essential that all Set Crew members become intimately familiar with the contents of this Installation Manual and of the BGB. A Certified Installer, certified by SWA, must be present on each installation of Superior Walls products.

Always keep these points in mind:

- Strict adherence to Superior Walls policies and procedures will ensure quality installations, satisfied customers, and a secure future for all Set Crew members.
- Since there is often an audience of interested by-standers, it is important that all crew members exhibit an attitude of professionalism.
- Professionalism and quality workmanship should be the standard of each Set Crew member on every installation site.
- In addition to professionalism and quality workmanship, Set Crew members must work in a safe manner. Do not take short cuts that jeopardize your safety and the safety of those around you.

Superior Walls of America takes pride in providing technical assistance to all certified installers. If you have questions or need assistance regarding the installation of Superior Walls products, please call the corporate office at 800-452-9255.

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1. JOB PLANNING

Prior to the day of installation, the Pre-Installation Jobsite Inspection Checklist (or similar) should be completed (See Appendix). This can be done by the Salesperson, the Crew Chief or the Installation Coordinator.

On the morning of the installation, the items below should be verified. This is typically done by the Crew Chief prior to departure from shop.

- ☐ Crew truck inventory is complete (see Pages 4-12 for Installation Supplies, Tools, etc).
- ☐ Area file is downloaded into the total station (when required).
- ☐ All batteries charged (extras as needed).
- ☐ Job drawing and load sheet are in your possession.
- ☐ Compare panel lengths on load sheet with job drawing.
- ☐ Do weather conditions permit proceeding with installation?
- ☐ Job Site Directions
- ☐ Fall Protection Plan Form

The following worksite sequence is ideal for the optimum use of time.

- ☐ Installation Crew is first to arrive on site.
- ☐ Level, screed & tamp stone and run string lines.
- ☐ Crane and truck depart for the job after receiving go-ahead from set crew.
- ☐ Crane should arrive at site 30-60 min. before site prep is finished.
- ☐ Safety & Pre-Job Huddle should occur after all personnel are on site.
- ☐ Begin installing panels after huddle is complete.

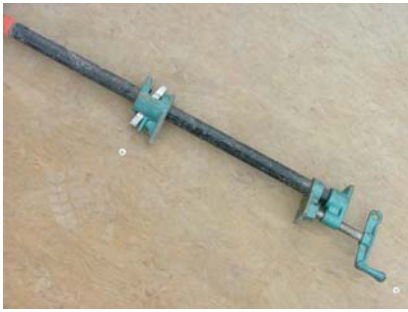
Remember: One minute spent planning ahead can save hours of wasted time on the job site.

CREW TRUCK: Installation Supplies, Tools, etc.

<u>Item</u>	<u>Description / Use</u>
Miscellaneous Items	
Total Station Layout Tool & Accessories	Used to accurately establish corner pin locations
Wall Packets – Green Sheet	To be completed and reinserted into wall packet then attached to QA Wall Packet poster with pin provided in the wall packet by the Crew Chief (Issued by SWA)(Keep protected from weather)
QA Wall Packet Poster	One required to be attached to Blue Board on each job
Orange STOP Stickers (by the roll)	To be placed by Installation Crew Chief (Two per Job)(Issued by SWA)
SWA Installation General Equipment Package	
Spreader Bar (12' or 14')	For handling & lifting panels
Lifting Straps (24", 48", 72", 96")	Connecting spreader bar to embedded anchors
Screw Pin Shackles (7/8", 1/2")	For attaching cables and hooks
SL Lifting Eye – PN 109	They attach at the embedded anchors in the wall.
Extra Lifting Straps	
'A' Frame Safety Hooks – PN 064A	Used to keep walls from tipping while unloading trailer.
Laser Level & Tripod	Used to establish bottom of wall grade
"I" Bolt – PN 041	Used ONLY when SL anchors cannot be used (used in conjunction with Comealong)
Comealong Hook PN 042	Can be placed into holes in top of wall & used to connect come-along
Batter Boards – 90° – PN 077A	For erecting and adjusting string lines
Batter Boards – Straight – PN 077B	
Batter Boards – Shafts– PN 077A11	
Corner Pin Indicators – PN 079D	
Stone Level Indicator – PN 079B	
Stone Level Indicator Pin – PN 079A	
Stone Screed (10') – PN 060A	Used to level or screed the crushed stone sub-footing
Stone Screed (6') – PN 060B	
10oz. Sealant Tube Gun – PN 107I	
20oz. Sealant Sausage Gun – PN 107J	
Bridle Slings – PN 087D	To attach crane hook to spreader bar
Leveling Angle Driver – PN 076B	To prevent damage to leveling angles
Leveling Angle – PN 076A	Used to establish stone grade
SWA Installation Supplies	
SWA Superior Seal™ (10oz. & 20oz.)	10 oz cardboard tube & 20 oz sausage tube
Hand & Tool Towels – PN 107H	
SWA Framing Strap – PN 152B	
Inside Corner – PN 105 (slotted)	Used to bolt inside corners together
Inside Corner – PN 105G (round hole)	
Inside Corner Angle (round hole)– PN 105C	Used to bolt 4'8" walls to 8'2", 9', & 10' walls
Inside Corner Angle (slotted hole) – PN 105F	

Items to be Purchased from Third Parties	
Grade Blocks (2x4 or other)	Used to determine grade height for stone footing
Ground Shovel	For light stone work
Garden Rake	For light stone work
Torpedo Level	Used when leveling grade blocks
200' Tape Measure	Used for laying out foundation & setting string lines
100' Tape Measure	Used for laying out foundation & setting string lines
Plumb Bob	Used for determining corner points at elevation changes
Plate Vibrator	Used to vibrate the stone footing at load bearing area
Ladders	Used to access top of wall, must also have in trench as a means of egress (OSHA required)
Trash Pump with Hose	Used to pump water out of excavated area
Knee Pads	
Concrete Patching Material	Concrete repair (must conform to ASTM C928)
Trowel	
Chain Saw	To cut down trees and clear jobsite
Gas Can for Mixed Gas	
Gas Can for Unmixed Gas	
2 Cycle Oil for Mixed Gas	

Generator	Used to power: hammer drill, trash pump, saws, etc.
Extension Cords	
Concrete Cutoff Saw (gas powered)	
Cutoff Saw Blades	
Hammer Drill	
Drill Bits for Hammer Drill	¼" Diameter for perimeter of larger holes, 2" core drill
Portable Bolt Tray	
Small Pry Bar	
100' Chalk Line	
Carpenter / Framing Square	Used to check for square occasionally during erection
Hacksaw & Extra Blades	
Vice Grip Pliers	
10" Adjustable Wrench	
2 – 3/8" Ratchets	
12 piece Socket Set	
2 – ¾" Open End Wrenches	Primarily used when bolting panels together
Come-along	Used to pull panels together (occasionally)
4' or 6' Level	To check wall for plumb and level
Nylon String	To establish string lines (guides) for setting panels
½" Bolts (assorted lengths)	Used to bolt panels together
½" Washers	Used to bolt panels together
½" Nuts	Used to bolt panels together
½" Threaded Rod	Occasionally used to bolt panels together
½" Coil Bolts	Fastening corner brackets & sill plate above headers
Plastic Shim Stock (5,000 psi minimum)	Use as spacers to level a panel on a support ledge
18lb. Pry Bar	Used to slightly move walls into final position
Propane Torch & extra propane	To remove moisture from panels before applying sealant
Assorted 2x4's & 2x6's	Primarily used for bracing panels
Construction Calculator	Used to calculate offsets, setbacks, diagonals, etc.
Claw Hammer (straight claw)	
30' tape measure	
Utility Knife	
Cold Chisel	For chipping excess concrete occasionally
Tool Pouch	For keeping tools organized
Assorted Nails (10d, 16d, etc.)	Multi purposes
Chain / Cable Sling	
5 Gallon water cooler & cups	
Bungee cords	
Padlock	Secure tools
Security chain	
MSDS Book	For emergency personnel in case of accident
3 lb. Hammer	
Cell phone	
Fire Extinguisher	Fully charged
Hard Hats	
Traffic Cones	
Safety Glasses/Goggles	Hammering, cutting, drilling, etc.
Large Trash Bags	For Jobsite Cleanup
First Aid Kit (fully stocked)	
Hearing Protection	For use with chain saw/concrete saw/rotary hammer drill
Dust Masks/Respirator	When cutting or grinding concrete
CAZ (Controlled Access Zone) Signs – PN 121H	
Superior Walls sign with franchise name & phone #	PN 121A & B
Install Measuring tool – PN 078A	Used to measure "diagonals"
Installation Brace (set) – PN 082A	
Bar Clamp	Drawing panels together
Rebar Caps	Prevent injury
Caution Tape	Marking the CAZ (Controlled access zone)
Wall Brace – PN 072	When backfill is required for modular housing
Marking Paint (orange)	



Bar Clamp (Garpa de Barra) -
Used to draw panels together



CAZ Sign (Letrero de CAZ) -
Used to enforce the Controlled Access Zone at the jobsite.



Rebar Caps (Tapas) -
Used to protect from injury.

Batter Boards -
Used to set up string lines which are used by Installers to properly position the panels



Coil Bolts (Perno de Tirabuzón) -
For fastening Corner Brackets and for attaching sill plates to the Bond Beam above window and door headers.



Brace (Installation Brace (Tirante de Instalación) -
Used to brace the first panel after it is installed.



Come-Along (Cabrestante) -
Used to draw panels together.



Caution Tape (Cinta de Atención) -
For marking the Controlled Access Zone.



Concrete Saw (Moto Sierra)



Construction Calculator (Calculadora de Construcción) -

For computing diagonal measurements.



Fire Extinguisher (Extinguidor de Incendios)

One fully charged fire extinguisher should be in each crew truck and crane.



Inside Corners & Angles (Sostén) -

For connecting inside corners.



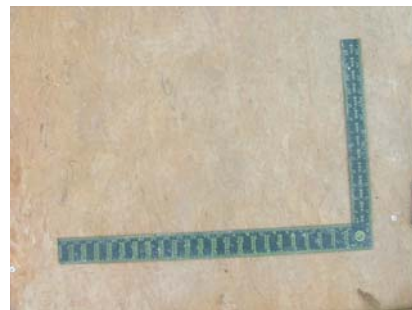
First Aid Kit (Botiquín de Primeros Auxilios)-

A fully stocked first aid kit should be in each crew truck.



Corner Pin (Alfiler de Esquina) -

Designed to be used by the Builder to indicate the corners of the foundation.



Framing Square (Escuadra de Combinación)



Ear Plugs (Tapas de Orejas) -

Use when exposed to continual noise over 85 decibels.



Framing Straps (Banda de Combinación)

Also known as "Mod Straps".



Generator (Generador) -
Used as a source of electric for power tools and lights.



I-Bolt (Gancho) -
Used to lift panels when SL Anchors are not available.



Hammer Drill (Taladro de Martillo) -
Used for drilling through concrete.



Knee Pads (Almohadillas de Rodillas) -
Used to protect knees when kneeling on stone.



Hand Towels (Toallas para Manos) -
For cleaning sealant from hands and equipment.



Laser Level & Tripod (Laser para Nivel) -
Used to establish stone grade.



Hard Hat (Casco) -
To be worn by crew members.



Level (Plumb-it Level) (Nivel) -
Used to check panels for plumb.



Leveling Angle (Ángulo de Nivel) “Screed Irons”-
Set in the crushed stone at the required level, prior to screeding, to provide a screed guide.



Pry Bar - small (Alzaprima - pequeño)



Leveling Angle Driver (Clavo para Ángulo de Nivel) -
Used to set Leveling Angles to the required location without damage to the Leveling Angle.



Pry Bar - 18 lb. (Alzaprima - grande)



Marking Paint (Pintura para Señales)



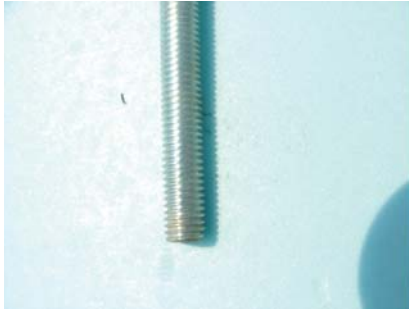
Rake (Rastrillo)



Plate Vibrator (Vibrador de Piedra) -
Used to tamp stone footing prior to setting panels.



Respirator (Respirador) - Use when cutting or grinding concrete. See OSHA 1910.134.



Threaded Rod (Perno Roscado) “All-Thread”-
(Machine thread) Used to fasten panels together.



Coil Rod (Perno Rapido) -
(Coil bolt thread) Used to fasten panels together.



Safety Chains (Cadenas de Seguridad) -
Used when offloading panels from trailer.



Safety Glasses (Gafas)



Scraper (Raspador) -
Ice scraper, bent on a 45 degree angle, is used to clean loose concrete and debris from edge of panels.



Sealant Tube Gun 10 oz. (Aplicador de Pegamento) -
(Tube Style) Used to apply sealant.



Sealant Sausage Gun 20 oz. (Aplicador de Pegamento) -
(Sausage Style) Used to apply sealant.



Plastic Shim Stock (Cuñas) - Must be min. 5,000 PSI plastic. Used as spacers to level a panel on a support ledge.



Sledge Hammers (Almádena) -
A variety of sizes for various uses.



Tape Measure (Cinta Metro)-
(30 ft. - 100 ft. - 300 ft.) Steel tapes are recommended. Tapes made of fabric or vinyl can stretch, causing inaccurate measurements.



Spreader Bar (Barra de Esparciador) -
Part of the lifting apparatus. Spreader Bar must be certified.

Nylon Straps (Banda de Nilón)-
Used to connect panels to spreader bar. The strap must be properly tagged.



Tool Tray (Caja de Herramientas)-
Used to carry tools, nuts, bolts, etc. on the jobsite.



Stop Sticker ("Stop" Etiqueta Adhesiva)
Designed to remind the Builder and the Homeowner to read the Builder Guideline Booklet.



Torch - propane (Antorcha - propano)-
Used to remove moisture from area of panel where sealant is to be applied.



QA Wall Packet Poster

Wall Packet (Paquete de Pared)-
Contains QA Sign-Off sheet and a Builder Guideline Booklet.



Traffic Cone (Cono de Transito) -
Used to warn motorists of hazardous conditions caused by installation equipment.



Wrench - Open End (Llave de Tuercas)



Trash Bags (Bote de Basura) -
Used for the collection and removal of trash from the jobsite.



Wrench - Socket (Llave de Casquillo)



Trash Can (Bolsa de Basura) -
Used for the collection and removal of trash from the jobsite.

2. SITE INSPECTION

Excavation

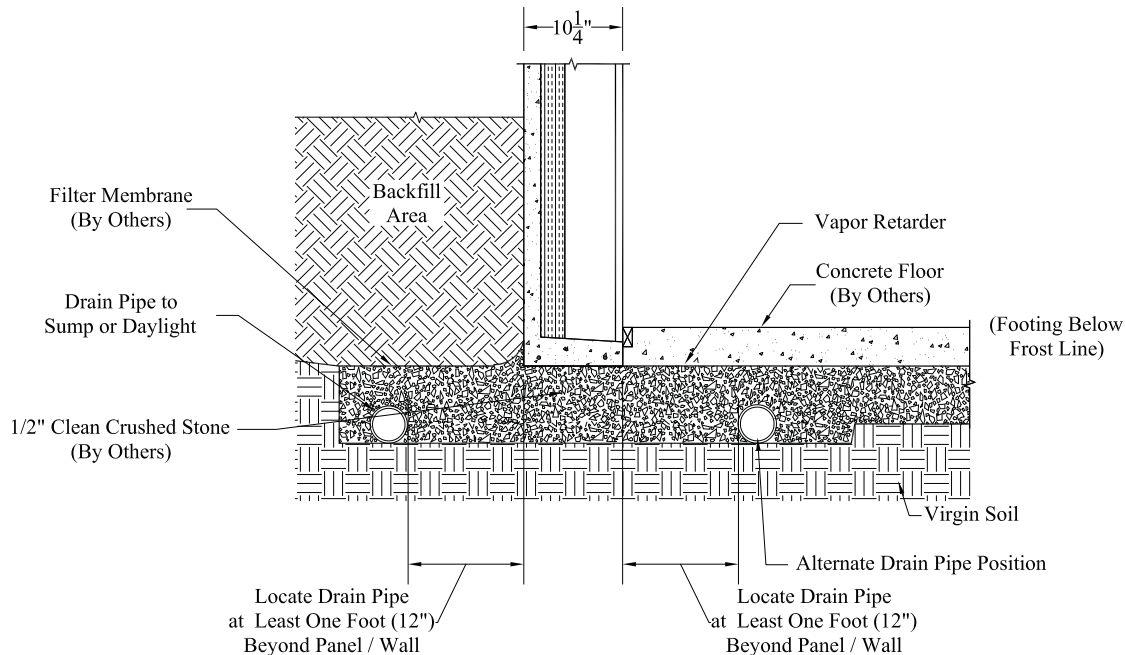
- Be sure that the following safe working conditions are present prior to beginning and during the installation:
 1. Properly benched or sloped banks (for excavations more than 5'-0" deep, bench or slope in accordance with OSHA Standard 1926.652).
 2. The minimum horizontal width (excavation to face of wall) at the bottom of the excavation is as wide as practical but not less than 2 ft. (Trenches must be dug to provide a minimum of 2' on both sides of the wall.)
 3. There is no water, surface tension cracks, or other conditions present that reduce the stability of the excavation.
 4. There is no heavy equipment operating in the vicinity that causes vibration to the excavation while employees are in the excavation.
 5. All soil, equipment and material surcharge loads are no closer in distance to the top edge of the excavation than the excavation is deep; however, when front end loaders are used to dig the excavations, the soil surcharge load shall be placed as far back from the edge of the excavation as possible, but never closer than 2 ft.
 6. Work crews in the excavation are the minimum number needed to perform the work.
 7. The work has been planned and is carried out in a manner to minimize the time the employees are in the excavation.
 8. A means of egress (i.e. a ladder or stairs) needs to be provided within 25' of all workers who are in a trench excavation. Workers who are in the "back fill area" between the foundation wall and the excavation wall are considered to be in a trench excavation, if the depth of the back fill area is 4 feet or greater. (See OSHA Standard 1926.651(c)(2).)
 9. A competent person must inspect the excavation at the start of the day and must be available to assess any changes that may occur during the work, i.e., weather changes and other factors that could reduce stability. OSHA defines a competent person as "one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them." (See OSHA Standard 1926.650(b).)
 10. Other site and licensee-specific safety practices/procedures as required.

Crushed Stone Footing

- Superior Walls panels must be supported on clean crushed stone. Clean crushed stone shall be free from organic, clayey or silty soils. Crushed stone shall be angular in nature and meet ASTM C33, with the maximum size stone not to exceed 1/2 inch. The crushed stone shall have a 1/2 inch nominal or smaller stone size.
- Stone should be evenly graded to +1" of level.
- Stone shall extend at least 1' beyond where panels will be installed.
- Depth of stone should be according to the project drawing.

Auxiliary Drain Pipe

- Verify that drain pipe is not within the footing bearing area.
- Diagram below illustrates proper drain installation.



Corner Pin Locations

- Pins must clearly define the builder's intent for foundation placement. If in doubt, verify before you continue.

Road Accessibility / Overhead Obstruction

- The driveway access must be wide enough to allow for trailer and crane access and level enough to avoid tipping.
- 9' and 10' walls are delivered on a drop deck trailer and have limited ground clearance.

Crane Accessibility

- Access to the project area should be prepared so the crane can be positioned in a location that allows the boom to reach to either side of the foundation or as specified on drawing.
- Verify that a level crane pad area with a solid base, free of overhead obstructions (trees, wires, etc.), is next to the foundation. Equipment must be kept a safe distance away from electrical lines.
- The crane pad must be a safe distance from the excavation hole and provide adequate room for the crane *and* outriggers to sit on solid ground.
- There must be a level area to allow the trailer to be parked near the crane.



Example of a proper “over-dig”.



Example of a proper crane/truck pad - solid ground with no overhead obstructions.

Cold Weather Practices

- Panels MUST NOT be installed on a frozen crushed stone footing.
- After the site was excavated, it should have been insulated in the area where walls are to be set and protected with a waterproof covering.
- The mixing of calcium chloride into the stone footing and then the covering of it will help prevent frost infiltration. The “extra” stone pile should also have been treated – it may be needed to fill in low spaces.

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3. SITE LAYOUT - String Line Method

1. Using the builder's corner pins as reference points, the crew chief and assistant first erect string lines to act as guides for panel placement. Typically, these strings are positioned at a one inch offset to the outside of the panel (see Fig. 3.1).
 - The information needed for layout will be included on the job drawings.
2. After string lines are set, be sure to verify all dimensions, including diagonals, prior to site preparation. **DO NOT** use a tape measure that is made of cloth fabric. Only steel tape measures are considered accurate.
 - A Total Station layout tool and a Construction Calculator can be extremely useful when setting up layout lines (see Fig. 3.2 & 3.3).

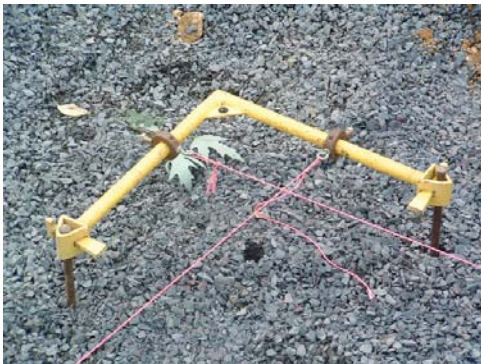


Figure 3.1
SWA batter-boards provide a convenient and accurate means of positioning string lines directly above corner pins.



Figure 3.2
A Total Station can provide for a quick and accurate layout.



Figure 3.3
The Crew Chief should be familiar with the use of a construction calculator.

SITE LAYOUT - Interior Chalk-Line Method

1. Check the stones for level.
2. Using corner pins set by the builder as reference points, establish two corners. These corners will typically be for the main front corners of the house, used to establish the required angle and position of the house relative to the road or property lines.

NOTE: The inside measurement of a straight section of wall between two 90° corners will be 1' 8-1/2" (10-1/4" panel width) shorter than the measurement of the outside corners.

3. Rough set the remaining corner points using small marker flags, keeping the flags sufficiently away from the required footprint of the wall to provide room for the vibrating tamper. See "flags" in Figures 3.4 and 3.5.
4. Grade stones to within $\pm 1"$ of level using a laser transit.
5. Compact stones with a minimum of 3 passes with a vibrating tamper. See Figure 3.5.
 - Make one pass slightly to the inside edge of the required footprint of the wall.
 - Make one pass slightly to the outside edge of the required footprint of the wall.
 - Make a final pass down the center.

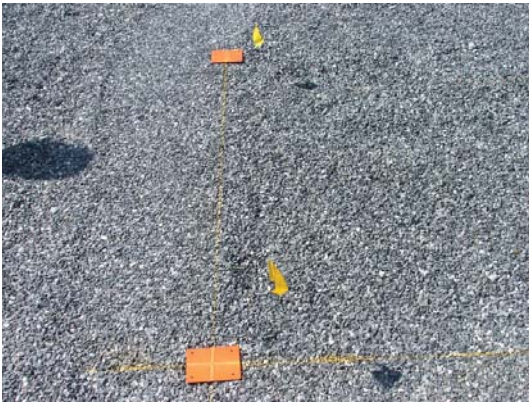


Figure 3.4



Figure 3.5

6. Place grade blocks or grade irons at intervals slightly less than the length of the screed that will be used to perform the final leveling of the stones.
 - Grade blocks should extend in a few inches past the eventual inside edge of the wall.
 - Position blocks at a 45° angle at corners.
 - Use a laser transit to ensure that all grade blocks are level to within a tolerance of $\pm 1/16"$.

Note: Extra time spent in leveling grade blocks and carefully screeding stone will result in a more efficient installation of panels.

7. Working from the inside, pull the screed in short movements across the grade blocks until the stones are level with the tops of the grade blocks. Do not use a back-and-forth sawing motion to level the stones.

Note: You may need to add more stone to bring up the level to that of the grade blocks. Do not fill in (bring up the level of the stones) more than 2" after the vibration has been done.

-
8. Using a Total Station, position a Chalk-Line Corner Plate exactly at each corner. Secure each Plate to the crushed stone with four (4) nails (see Figures 3.6 & 3.7).

NOTE: As an alternative to the Total Station, a tape measure may be used to properly position the Chalk-Line Corner Plates.

9. After Chalk-Line Corner Plates are set, position a chalk-line over and past the center holes in the Plates then snap a chalk-line on the stones. Be careful to not move the Plates while positioning and snapping the lines (see Figure 3.7).



Figure 3.6



Figure 3.7

10. Confirm that the layout lines are correct by taking diagonal measurements.
11. Place the inside of the 45° Corner Marking Tool on the chalk-lines at the 90° corner of the desired first corner panel. Snap a 45° chalk-line by utilizing the pin and hole located on the 45° Corner Marking Tool. Use this line to help line up the first wall panel (see Figure 3.8).
12. Begin to set the walls, starting with a corner panel, directly on the snapped chalk-lines. Brace this first wall panel with an SWA Install Brace.

NOTE: A Wall Panel Guide, used to help set the panel directly to the line by placing the front of the tool on the chalk-line, is shown in Figure 3.9.

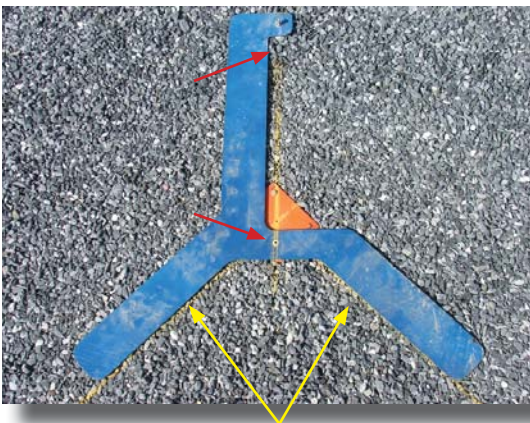


Figure 3.8 Chalk-lines at a 90° corner



Figure 3.9

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4. SITE PREPARATION

1. **GRADE STONE** - Using a laser level, grade stone to within a 1" tolerance (see Fig. 4.1).
2. **VIBRATE STONE** - Tamp stones with a minimum of three passes using a plate vibrator. One pass slightly to the outside edge (several inches beyond the string), one pass slightly to the inside edge, and a final pass down the center (see Fig. 4.2).
3. **INSTALL GRADE BLOCKS** - Place grade blocks or grade irons at intervals slightly less than the length of the screed that will be used. Grade blocks should extend a few inches past the string line. Position blocks at a 45° angle at corners. Use a laser level to ensure that all grade blocks are within a tolerance of +/- 1/16". Extreme care at this point can virtually eliminate the need to re-lift panels during installation (see Fig. 4.3).
4. **SCREED STONE** - Working from the inside, pull the screed in short movements across the grade blocks until level. Do not use a back-and-forth sawing motion. You may need to fill in at some spots, but do not fill in more than 2" after vibrating has been completed (see Fig. 4.4).



Figure 4.1
Grade stone to within 1" tolerance (of the desired finish height of stone) before tamping.



Figure 4.2
Make a minimum of three passes with a vibrating tamper.

NOTE: Extra time spent in leveling grade blocks and carefully screeding stone will result in a more efficient installation of panels.



Figure 4.3
Steel angles can be used for grading blocks. Some crews prefer to use wooden blocks.



Figure 4.4
Screed stone by pulling a screed toward you. Do not use a sawing motion.

NOTE: Do not step on or disturb stone after it has been screeded.

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5. CRANE AND TRUCK ARRIVAL

General Guidelines

- The crane should arrive on the job 30 to 60 minutes prior to site preparation being complete. The Crew Chief must be ready to direct the crane operator to the proper location at this time.
- The crane outriggers must be properly blocked and supported on firm soil (see Fig 5.1).
- The truck with the panels should arrive just prior to the completion of site preparation. The Crew Chief must be prepared to direct the driver to the proper parking location.
- After the crane operator and truck driver(s) are on-site, the Crew Chief should call for a pre-job huddle. The huddle shall be attended by the entire crew, the crane operator, and the truck driver (see Fig. 5.2). Items to discuss in the huddle are:
 - a. **Signals** - Ensure that signal person(s) and crane operator are using the same crane signals (see following page).
 - b. **Sequence of panel placement** - Discuss panel installation sequence.
 - c. **Safety Issues** - Discuss all site-specific safety concerns or issues.
 - d. **Secure the area** - Establish and enforce a Controlled Access Zone (CAZ).



Figure 5.1
Crane outriggers must be properly blocked and supported on firm soil.



Figure 5.2
At the pre-installation huddle, crane signals, panel sequence, Controlled Access Zone and safety issues are discussed.

Controlled Access Zone (CAZ)

A Controlled Access Zone (CAZ) must be established to help prevent unauthorized persons from entering the work area. Each employee permitted in this area should be identified by name or other manner, such as hard hat color. No other employees or persons may enter the CAZ. This restricted Zone includes:

- Any area over which panels will swing during installation
- Any area where the crane, trucks, or other equipment are parked
- Any area where there are holes or ditches
- Any area where hazardous materials or equipment is stored

The Controlled Access Zone should be clearly marked.

1. Place 1 or 2 CAZ Warning Signs at the perimeter of the Site
2. Place Warning Tape around the perimeter of the Site
3. Use Traffic Cones anytime a truck or crane has to be parked on or near a road
4. Place Warning Tape between the outriggers of the crane
5. Place Rebar Caps on any stake or rod

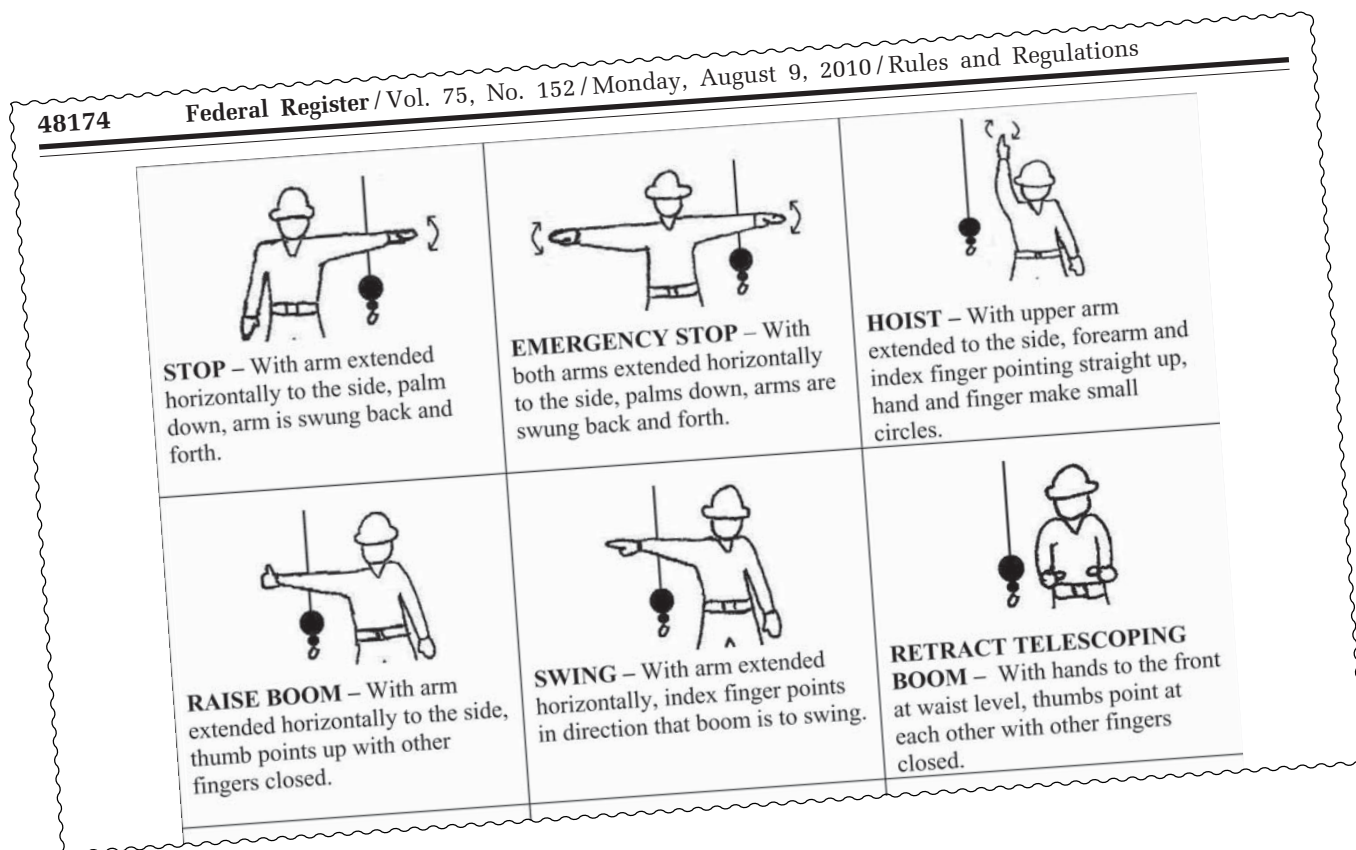


Qualified Signal Person and Rigger Requirements

OSHA has specific requirements for 'qualified' signal persons and riggers. These requirements went into effect on November 8, 2010. See the OSHA Signal Person and Rigger Fact Sheets and related referenced requirements for more information (www.osha.gov/Publications/cranes-signal-person-fact-sheet.pdf and www.osha.gov/Publications/cranes-qualified-rigger-factsheet.pdf). See Appendix A of this Manual for copies of these Fact Sheets.

Crane Signals

OSHA Standard Hand Signals can be found in the Appendix A to Subpart CC of Part 1926--Standard Hand Signals ("Appendix A" link at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=130). See sample below.



Panel Offloading Procedures

1. Hard hats must be worn at all times while offloading panels and while crane is in operation.
2. A “controlled access zone” shall be established and enforced (refer to CAZ, Pg. 23).
3. Trailer must be parked as close to level as possible.
4. Truck dollies must be blocked to prevent tipping (see Fig. 5.3).



Figure 5.3

Truck dollies must be properly blocked and supported on firm soil to prevent tipping.

5. Two safety chains shall be used for each group of panels. This will ensure that panels will be secure even when one chain is being moved or adjusted. Each truck should always have four safety chains available. Due to loading sequences required by the size of panels or the presence of ledges, the crane will need to alternate between offloading the front group and the rear group on the trailer. This will require four chains to be in use at the same time.
6. Safety chains can be attached to panels either with an “SL Lift Eye” (P/N 109) or a “Comealong hook” (P/N 042). The comealong hook is inserted through a hole in the bond beam (see Fig. 5.4). The SL Lifting Eye is used in cases where a hole is not available (see Fig. 5.5).



Figure 5.5
SL Lift Eye



Figure 5.4
Comealong hook

-
7. Attach safety chains to outside panels extending across the top of all panels, using two safety chains on each group of panels (see Fig. 5.6). Most loads will contain two sets of panels, one on the front and one on the rear of the trailer. Each set of panels requires two safety chains.



Figure 5.6

Attach safety chains to the outside panels before removing shipping straps.

8. Loosen one of the shipping straps or chains slightly, (preferably the center one) but do not remove it.
9. Remove the rest of the shipping straps or chains.
10. Finally, remove the shipping strap or chain that was loosened slightly at the beginning.
11. Begin with the first panel that will be used for the project. Safety chains have already been fastened to the outside panels. Connect the spreader bar to as many SL pins as possible on this first panel. When you get to the first safety chain that needs to be released, attach it to the next panel in back of the panel that is being removed. Signal the crane to remove the panel. (Refer to crane signals on Pg. 24.)
12. Repeat this procedure until you arrive at the last two panels in the group.
13. When you remove the safety chain from the second to last panel, hook it to the A-frame to restrain the last panel on the opposite side of the stand.

6. PANEL PLACEMENT

Panel Placement Procedure (String Line Method)

1. Starting at an outside corner farthest from the crane, place first panel 1" away from string line. Using a 1" offset will ensure that the rough face of the panel will not disrupt the string line. On newer forms, the outside end of the panels at 45°/90° corners has been modified to create a better sealant joint. When installing these panels, the end must be placed 1¼" from the string line. The outside face, however, should remain at a 1" offset (Fig. 6.1). When installing panels that have the old style sealant joint, a 1" offset should be used from both the face and the end.



Figure 6.1

The new style of sealant joint requires a 1" offset from the face, and a 1¼" offset from the panel end at 45°/90° corners.

2. Level and plumb panel.
Important: You will now perform the most dangerous part of the installation - setting the second panel. Before releasing the crane, properly brace the first panel!! Install an approved brace. (See instructions for using SWA Installation Brace on the following page.) It is not acceptable to brace this panel with a simple wooden 2 X 6 or screed board or any other type of prop that is not safe and secure.
3. After first panel is properly braced, remove any loose concrete or debris from the edges and apply the sealant (see sealant application instructions in Chapter 7).
4. The second panel is now placed to create a stable corner. As the second panel is being moved into place, check the edges and remove loose concrete as necessary. Take care to prevent ends of panels from scraping together as the second panel is placed. This will damage the sealant bead (see Fig. 7.7 in Chapter 7).
5. After second panel is in place and level and plumb, insert top and bottom bolts and tighten.
6. The crane can now be released from the second panel.
7. While the third panel is being hooked up, the crew should be applying sealant to the edge of the second panel. The interior and exterior sealant beads can now be applied.
8. Repeat until all panels are installed, making sure each panel is level and plumb.
9. Confirm wall lengths with load sheet during installation so that panel spacing can be adjusted as required.

SWA INSTALLATION BRACE: Operating Procedure

NOTE: See laminated instruction & parts list attached to SWA Installation Brace.

1. Prep site for placing of panels. Be sure to level the area where the Footer Support Link will be positioned.
2. Choose proper Top Plate for first panel. Adjust the Inside Adjusting Support and Footer Support Link for proper wall height.
3. Determine which hole in the Bond Beam you will be using for Top Plate placement.
4. Use the crane to place the first panel in position.
5. Locate proper Footer Support Link position, making sure that the Foot Anchor is attached to the Footer Support Link. Place Footer Clamp only, under first panel, ensuring that it is against footer beam. (Note: Footer Support Link is not used on four foot walls.) (See Fig. 6.2)
6. With Top Plate attached to Inside Adjusting Support, position Top Plate over the pre-determined Bond Beam hole. (See Fig. 6.3)
7. Insert Top Plate Pin Assembly through Top Plate and Bond Beam. Attach Outside Support to the Top Plate.



Figure 6.2



Figure 6.3

8. Connect Inside Adjusting Support to the Footer Support Link/Foot Anchor.
9. Choose proper length Stake, and drive through Foot Anchor. The 12" stake is the stake that should be used in most applications. Use a longer stake if stone footing depth is greater than 6" or if working in sandy or loose soil. (See Fig. 6.4 & 6.6)
10. Ease the tension on the Lifting Straps, but do not release the crane.
11. Using a 3/4" wrench, turn adjusting screw on the Inside Adjusting Support to plumb the panel. (See Fig. 6.5)

12. Adjust Outside Support to proper length, choose correct Stake and drive Stake to secure panel.



Figure 6.4



Figure 6.5

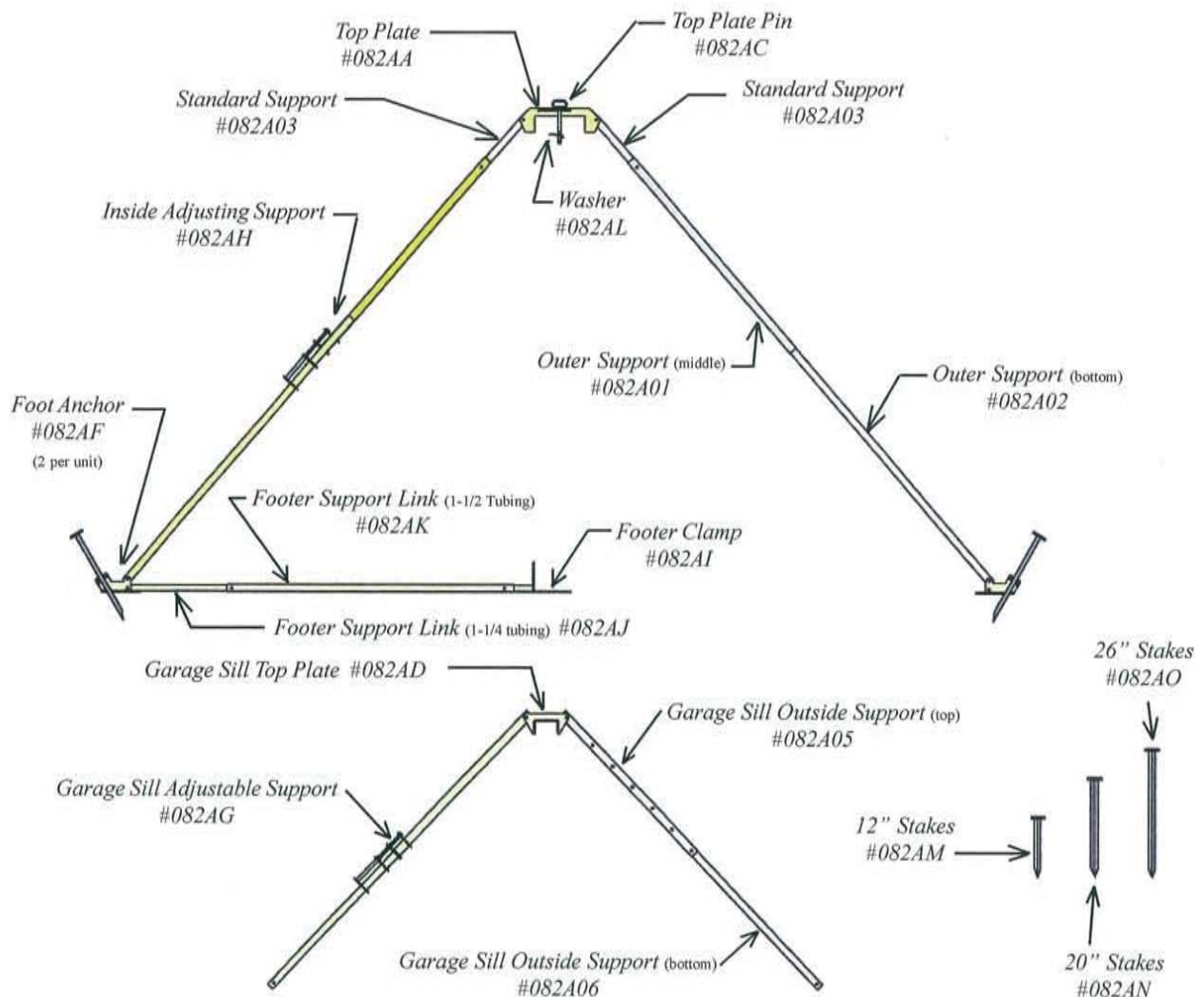


Figure 6.6 Install Brace (P/N 082A) - Individual Parts Names and #'s from the Xi Parts Catalog

ADDITIONAL PANEL BRACING PROCEDURES

Under normal conditions, it may be only necessary to brace the first panel. The first and second panel should form a stable 90° corner. After you have bolted the first two panels and determined that you have a stable and safe structure, you may wish to remove the Installation Brace.

Other situations that require bracing are as follows:

- A. When a continuous in-line span of three or more panels is installed, bracing may be required to keep panels plumb. In this case, since safety is not a factor, wooden 2x6's or 2x4's can be used.
- B. When you have a continuous in-line span of 32 ft. or more, regardless of the number of panels installed, bracing may be required to keep panels plumb. 2x6 or 2x4 material is also acceptable in this case.

INTERSECTING WALLS - Resting on Support Ledges

Intersecting Walls

- Be sure that the top surface of the support ledge is smooth and free of cracks and crevices that might hold water. This type of ledge surface will help prevent structural damage due to freezing and thawing.
- When shims are needed, shims shall be only thermoplastic material with a minimum compressive strength of 5,000 psi.
- The distance from the support ledge to the crushed stone footer shall not exceed 5'. See Fig. 6.7.
- If over-dig exceeds 5', an intermediate support column is required unless project-specific engineering is provided. See Figure 6.8.
- The intersecting Superior Walls panels should be bolted together through the end stud of the garage/frost wall and through holes drilled through the face of the basement wall, or bolted using bolting saddles that were cast into the basement wall.
- Properly seal around the bolts with sealant. Replace the cut out foam insulation over the bolts after bolting, or use spray foam to insulate around the bolts on the interior of the basement wall.

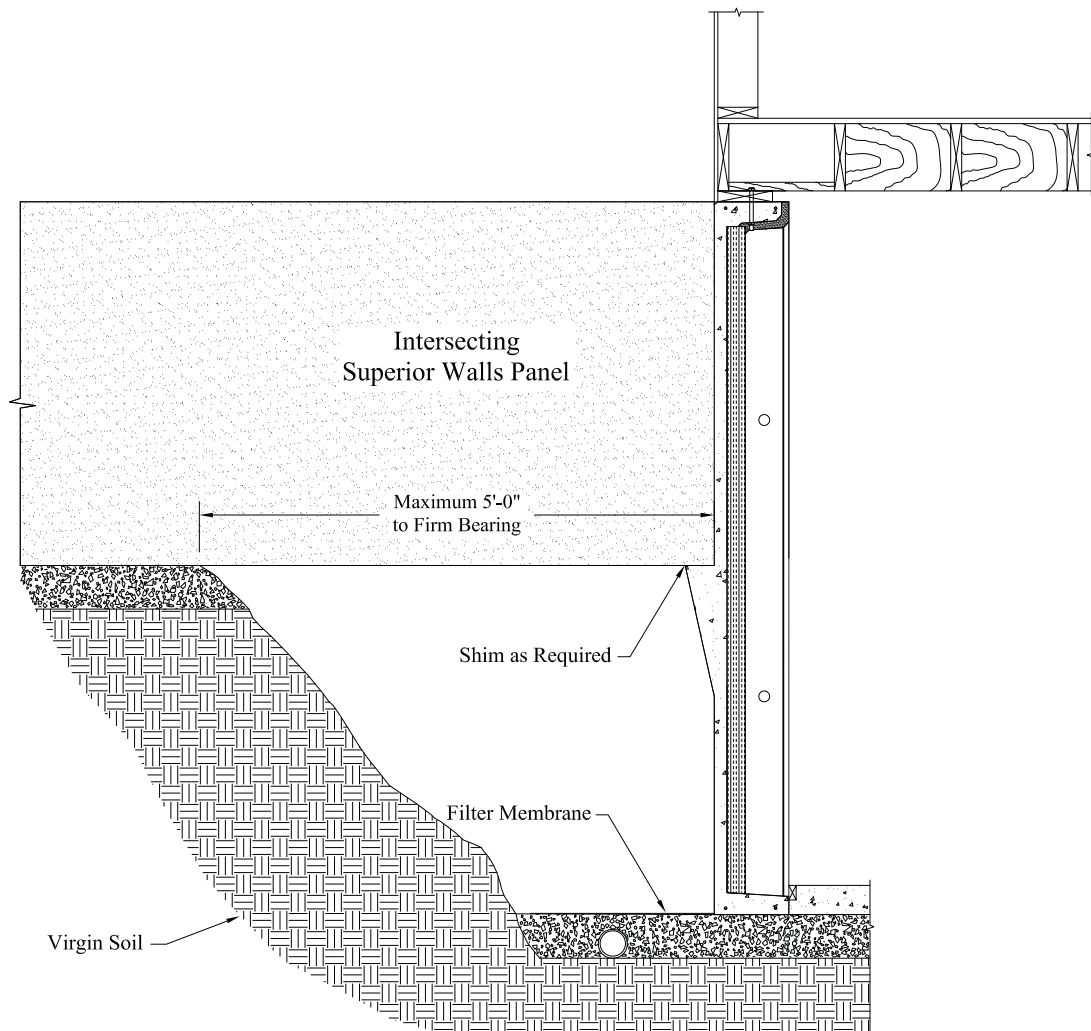


Figure 6.7

Intersecting Wall with Excessive Overdig Procedure

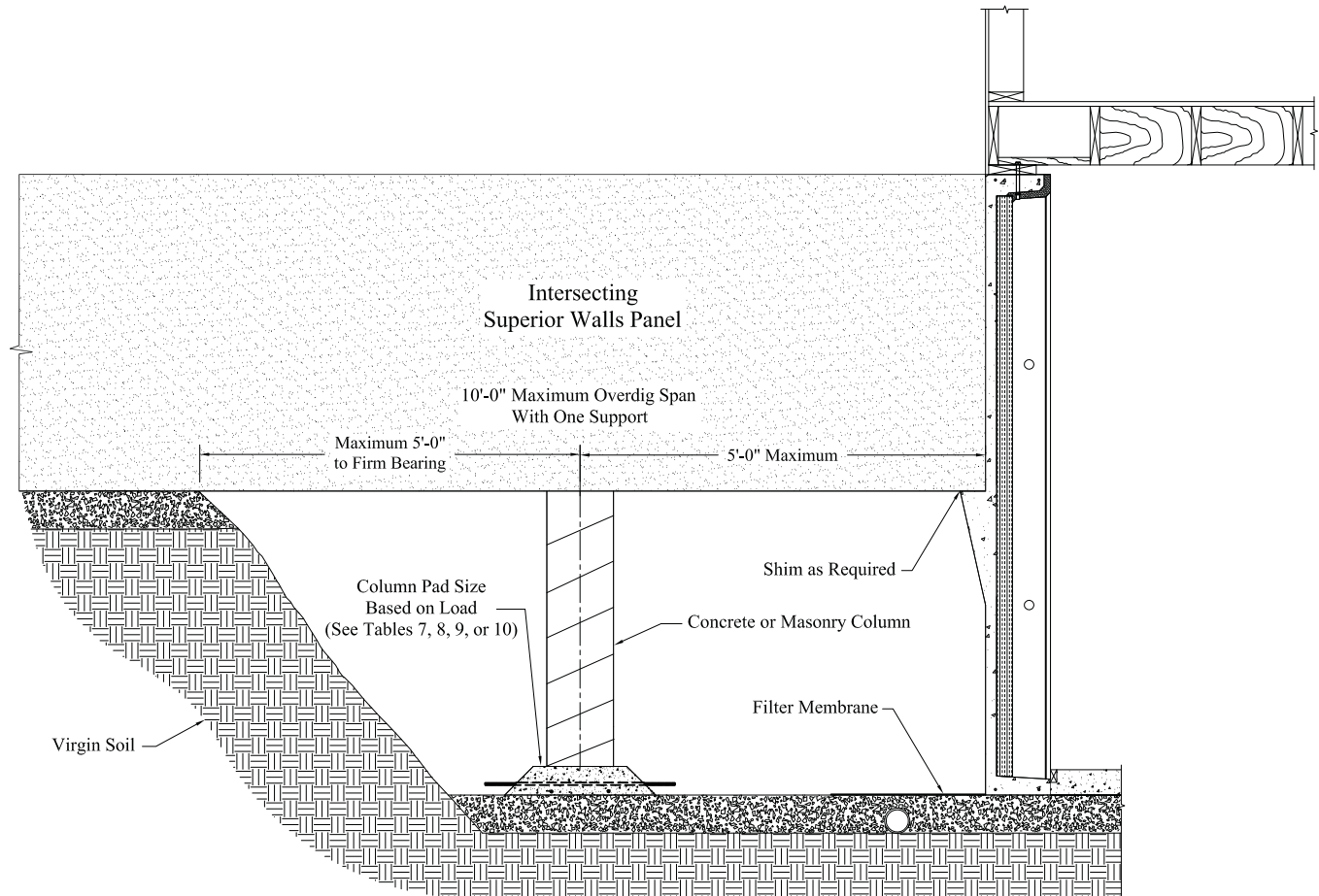


Figure 6.8

WALL STACKING: Superior Walls Frost Walls

When stacking walls on Superior Walls panels being used as frost walls, the following items are critical:

- Crushed stone footing below base wall must be level
- Base walls must be level and plumb
- Base walls must be square

Stacking Procedure

- Apply two beads of Superior Sealant to the entire length of the bond beam of the base wall. Each sealant bead should be 'finger-thick' and applied approximately one inch from the inside and outside edge of the top bond beam.
- Be sure to have 1/8" and 1/4" shim material available to adjust the upper wall into a plumb and level position. Use only shims of thermoplastic material with a minimum compressive strength of 5,000 psi.
- After panel is stacked and adequately braced, drill holes through the footer beam of the upper wall and the top bond beam of the base wall at a maximum spacing of 48" on center. Holes should be positioned at 5" out from inside edge of the footer beam (to avoid the rebar).
- Secure panels together using 1/2" x 7" bolts. See Figure 6.9.
- Frequent bracing of panels is advised.

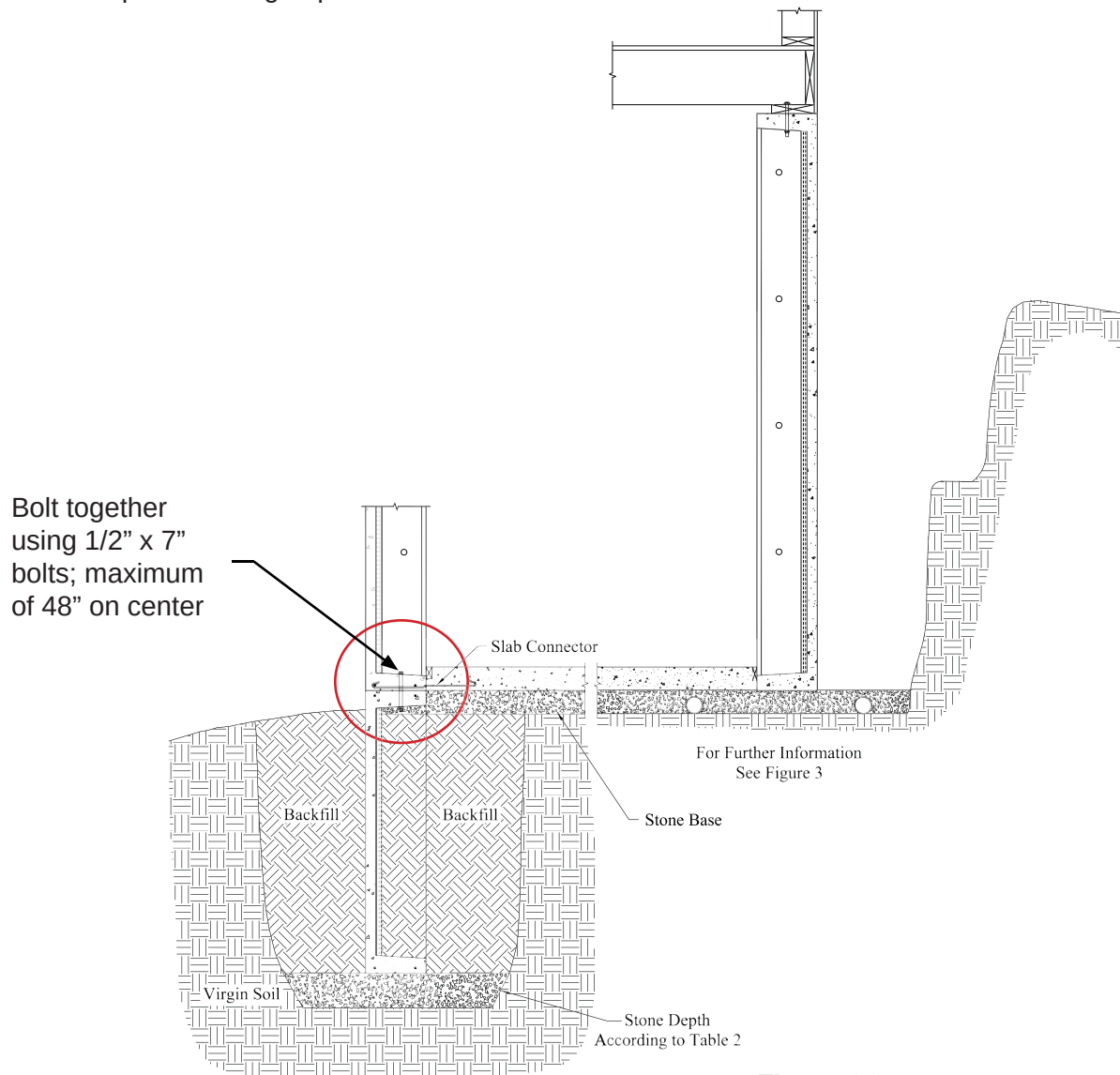
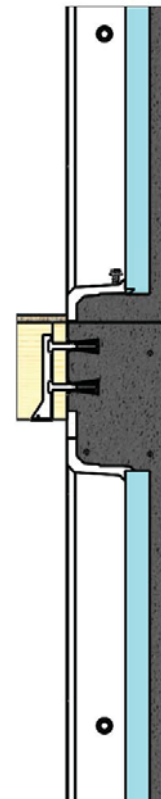
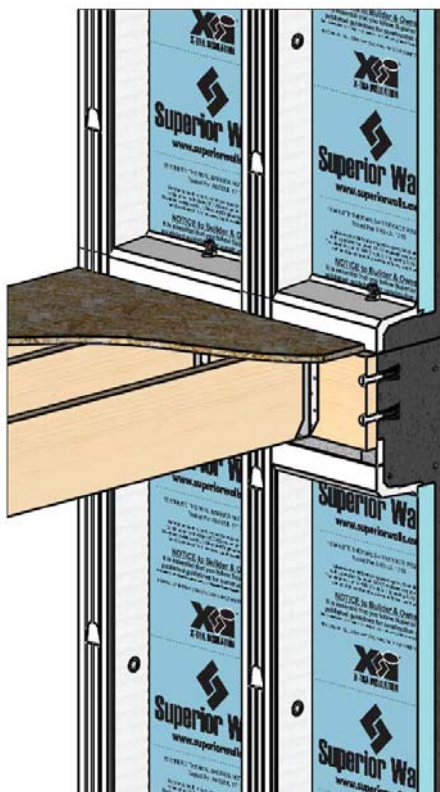


Figure 6.9

Xi ABOVE GRADE WALLS: Stacking Procedure

When using Xi panels for above grade applications, the following instructions should be carefully followed to properly stack the Xi Superior Walls panels, unless otherwise directed by site-specific engineering. Read ALL instructions before starting. Reference project drawings for required fastener spacing.

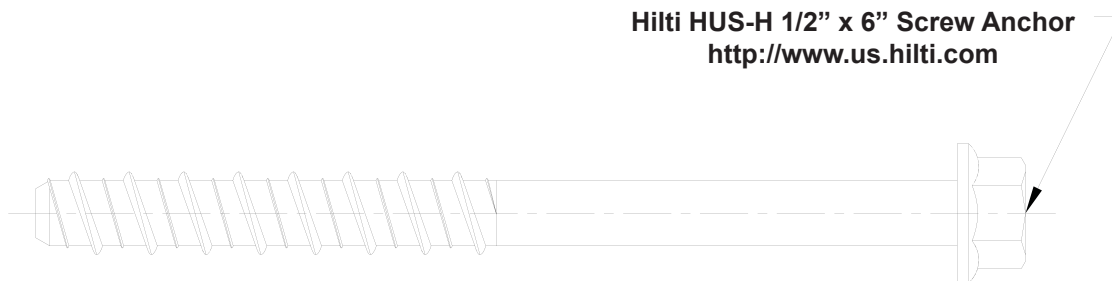
1. Make sure that builder/contractor has completely installed ledger boards, joists, and sub-flooring.
2. Clean the top of the bond beams of the previously installed panels (to eliminate obstructions that would prevent a plumb or level installation of the second row of panels).
3. Enforce the controlled access zone (CAZ).
4. Before setting the first panel, remove all dirt, loose concrete, and frost or moisture from the edges of the panel.
5. Apply two (2) 1/2" beads of Superior Sealant to the upper edge of the bond beam of the previously set panel or panels at the length of the next panel to be set. The first bead should be 2" in from the outside face of the wall and the 2nd bead should be 2" from the inside edge of the wall.
6. Set the first panel in correct position and plumb.
7. Secure the panel in position using a brace or braces to the first floor decking that properly restrain the panel. See Xi Stacked Walls - Temporary Panel Bracing (w/Decking).



8. Drill 7/16" holes (for Hilti HUS-H 1/2" x 6"; verify hole specs required by fastener manufacturer) through the footer beam of the first panel and into the bond beam of the first level wall:

- Drill a hole in the first and last available stud bays (5" from inside edge of footer beam and as close as possible to the outside studs), and
- Drill holes as needed to get the required on-center fastener spacing (spaced out 5" from inside edge of footer beam). Reference project drawing for required fastener spacing.

9. Fasten upper panels to the lower panels, using Hilti HUS-H 1/2" x 6" screw anchors in the previously drilled holes.



10. Unhook the Spreader Bar.

11. Apply a 1/2" vertical connecting sealant bead on the side edge of the first panel.

12. Repeat Steps #4 to #11 for the next panel.

13. Continue to place one panel at a time until all panels are in position and fastened and secured properly.

14. Apply and tool all internal and external sealant beads, using all required safety equipment and practices.

15. Complete end-of-job procedures.

- Verify that all measurements and tolerances are correct.
- Clean up all trash and debris from the jobsite.
- Do not remove the temporary bracing until top of wall attachments (ledger board and floor system or sill plate and other required framing systems) are complete.
- Drill 1/2" holes in the Bond Beam within 12" from corners for sill plate attachment by framers, if using conventional framing.
- Leave adequate supply of Coil Bolts for framers to use to fasten the sill plate to the inserts in the Bond Beam above headers, if using conventional framing.
- Apply orange "Stop" stickers to the bond beam on opposing sides of the structure.
- Attach wall packet and poster to the foam insulation, at the center of the longest panel, between 2 studs at mid-height.

Xi STACKED WALLS: Temp. Panel Bracing (w/Decking)

When stacking Xi wall panels for above-grade applications, temporary panel bracing is required to secure the panels to the wood decking until the framing/decking connection at the top of the braced panels is complete. The following instructions should be carefully followed unless otherwise directed by site-specific engineering. These bracing instructions do not apply to back-filled, below-grade, stacking applications.

MATERIALS REQUIRED

- 16d Nails
- 1/4" x 3-1/2" Simpson Strong-Tie® Strong-Drive® SDS Deck Screws, or equivalent
- 3/4" A36 Threaded Rod
- 3/4" Nuts and Washers
- 2x4 Lumber (Each brace utilizes two pieces of 2x4 lumber)
 - 10'-0" Xi Wall Panels (Standard Xi Configuration): Use 10'-0" lengths (2x4x10)
 - 10'-0" Xi Wall Panels (SWA Ledger Board Configuration): Use 8'-0" lengths (2x4x8)
 - All Xi Wall Panels less than 10'-0" height: Use 8'-0" lengths (2x4x8)
- 2x6 Lumber for Blocking

NOTE: Bracing lumber, blocking, and 3/4" threaded steel rod may be precut before arrival at the installation site to speed up the installation process as many braces will be needed to complete the install.

The following Temporary Bracing instructions are for one brace, used on one Xi stud.

See Bracing Schedule in the following pages for required spacing of braces.

1. Mark the location for the installation hole on the 2x4, 2-3/16" from the end, and 1-3/4" from the side. See Figures below.
2. Clamp two (2) pieces of 2x4 bracing lumber together, making sure that the pieces are straight and parallel to each other. Drill a 3/4" hole through both pieces of lumber at the previously marked location. See Figure below.



Step 1.1



Step 1.2



Step 2

-
3. Cut a 10" piece of 3/4" A36 threaded rod. Attach a 3/4" washer and nut to one end of the threaded steel rod.
 4. Position the two (2) pieces of 2x4 bracing lumber on both sides of the Xi stud, with the 3/4" holes aligned with the top chase hole in that stud.
 5. Slide the 10" piece of 3/4" A36 threaded rod through the first piece of 2x4 bracing lumber, into the upper chase hole, and then through the second piece of 2x4 bracing lumber on the opposite side of the Xi stud. See Figures below.



Step 5.1



Step 5.2

6. Attach a second 3/4" washer and nut to the opposite side of the 10" threaded steel rod. Tighten nut(s) until the braces fit snug against the stud. See Figures below.



Step 6.1



Step 6.2

7. Cut 25" pieces of 2x6 lumber: Two (2) per brace when joists run parallel to the wall.
Three (3) per brace when joists run perpendicular to the wall.
8. Place one of the 25" pieces of 2x6 lumber on the subflooring between the bracing lumber. Do NOT secure to the subflooring until the wall panel is plumb.
9. Ensure that wall panel is plumb and level.

NOTE: If the joists run parallel to the wall panel, follow step #10, if the joists run perpendicular to the wall panel, follow step #11.

-
10. A. Secure the first 25" piece of 2x6 blocking to the deck (subflooring). Blocking must span a minimum of two (2) floor joists and should be attached using six (6) 1/4" x 3-1/2" SDS decking screws, three (3) screws centered in each joist. See Figure 10-A.
- B. Secure the second 25" piece of 2x6 blocking to the top of the first piece with six (6) 1/4" x 3-1/2" SDS decking screws. See Figure 10-B.
- C. Secure each piece of 2x4 bracing lumber to the 2x6 blocking with seven (7) 16d 3-1/2" nails on each side of the blocking. See Figure 10-C.



Step 10-A



Step 10-B



Step 10-C

11. A. Secure the first 25" piece of 2x6 blocking to the deck (subfloor), making sure that the blocking is wedged up tight against the 2x4 bracing lumber. Blocking must span a minimum of two (2) floor joists and should be attached to the deck with six (6) 1/4" x 3-1/2" SDS decking screws, three (3) centered in each joist. See Figure 11-A.
- B. Secure the second 25" piece of 2x6 blocking to the deck, positioned in between the 2x4 bracing lumber and against the first piece of blocking. Attach using a minimum of two (2) 1/4" x 3-1/2" SDS decking screws. This will create a "T" shape. See Figure 11-B.
- C. Secure the third piece of 2x6 blocking on top of both pieces of previously placed blocking. Attach using a minimum of eight (8) 1/4" x 3-1/2" SDS decking screws, six (6) of which MUST be screwed into the first piece of blocking. See Figure 11-C.
- D. Secure each piece of 2x4 bracing lumber to the 2x6 blocking with seven (7) 16d 3-1/2" nails on each side of the blocking, as shown in Figure 10-C above.



Step 11-A



Step 11-B



Step 11-C

NOTE: Use the following Bracing Schedule to determine the required spacing between braces.

BRACING SCHEDULE		
Wall Size	Maximum Spacing	2x4 Brace Length
8'2"	10'	8'-0"
9'	8'	8'-0"
10' w/Ledger	6'	8'-0"
10'	4'	10'-0"
NOTE: This Bracing Schedule can be used with Bracing as constructed per the previous instructions in wind speeds up to 40 MPH . Higher wind speeds will require additional bracing as specified by the Project Engineer.		

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7. SEALANT APPLICATION

A properly prepared, applied, and tooled sealant joint is essential to providing your customer with a dry and comfortable living experience. Carefully use the following sealant application techniques.

Surface Preparation

- All dirt, debris, and loose concrete must be removed before sealant is applied (see Fig. 7.1, 7.2 & 7.3).
- Moisture and/or frost must be removed before sealant is applied. A quick pass over the surface with a propane torch may be used to remove the moisture/frost (see Fig. 7.4).

NOTE: Sealant surface must be clean and dry



Figure 7.1



Figure 7.2



Figure 7.3



Figure 7.4

Applying the Connecting Bead

- Connecting bead is applied to leading edge of each panel before next panel is moved into position. One bead, finger thick, should be applied from top to bottom, approximately one inch from the outside edge (see Fig. 7.5 & 7.6).



Figure 7.5



Figure 7.6

- Do not damage connecting bead by scraping panels together (see Fig. 7.7).

Applying & Tooling the Interior Bead

- Apply interior bead and tool bead as shown (see Fig. 7.8).
- Apply and tool interior bead to the under side of the Bond Beam and to the inside face of the Bond Beam at joints. Note: Application to inside face of Bond Beam may be omitted at outside corners if installers use the Install Measuring Tool (P/N 078A).



Figure 7.7



Figure 7.8

Applying the External Bead

- Apply exterior bead of sealant to all joints. Remember, more sealant is not necessarily better. Cut nozzle of applicator on an angle, the same width as the joint, and apply only enough sealant to fill the joint (see Fig. 7.9 & 7.10).
- Apply sealant bead a minimum of 2 inches from the outside edge on top of Bond Beam so that it extends under the sill plate (see Fig. 7.11).



Figure 7.9



Figure 7.10



Figure 7.11

Tooling the External Joint

- Tool all joints in a manner that will push the sealant into the joint, without spreading excess onto the panel face.
- A variety of instruments can be used to tool both the exterior and interior joints (see Fig. 7.12 & 7.13). Tooling the exterior joint in this manner will ensure that sealant is pushed into the joint and creates an exterior surface that will be functional for many years.



Figure 7.12



Figure 7.13

Alternative Sealant Application Method

Use this method if the connecting bead of sealant is not applied during installation. This method applies to all joints on exterior wall panels.

Tamko® TW-60 Waterproofing Method

Required Tools and Materials:

- Superior Sealant
- Caulk Gun
- Tamko TW-60 Self-Adhering Sheet Waterproofing Membrane (9" wide roll)
- Tamko TWP primer (TWP-1 Quick Dry Primer or TWP-2 Water-Based Primer)
- 9" Thick-Knap Roller Frame and Cover
- Rubber Roller (Plastic Laminate J-Roller by Gundlach®)
- Tamko TWM-1 Mastic
- Plastic Putty Knife
- 10" wide Protection Board (1" Blue Board shown). See Pg. 46 for alternatives.

1. Instruct the builder to indicate the level of final grade by marking the wall (Fig. 7.14).
2. Scrape loose concrete and debris from the joint (see Figure 7.15).



Figure 7.14



Figure 7.15

3. Apply Superior Sealant to the joint (see Figure 7.16).
4. Tool the joint in a manner that will push the sealant into the joint, without spreading excess onto the panel face (see Figure 7.17).



Figure 7.16



Figure 7.17

-
5. Apply Tamko TWP Primer to the sealant joint below the grade line and approximately 6" on either side of the joint using a thick knap roller (Fig. 7.18).
 6. Allow Primer to dry for approximately 15 minutes.
 7. Apply 9" wide Tamko TW-60 membrane to the joint. Starting at the grade line and centering the strip on the sealant joint, remove the release paper as you apply the membrane to the wall. Use a rubber roller to make sure the membrane adheres to the wall (Fig. 7.19).



Figure 7.18



Figure 7.19

8. Apply Tamko TWM-1 mastic to the edges of the TW-60 membrane and tool with a plastic putty knife (see Figures 7.20 & 7.21).



Figure 7.20



Figure 7.21

-
9. Apply Tamko TWP Primer to the membrane using a thick knap roller (Fig. 7.22).
 10. Allow primer to dry for approximately 15 minutes.
 11. Apply 10" wide protection board (or other width as required) to the surface of the waterproofing membrane as shown in Fig. 7.23. This is to protect the membrane during the backfilling process.

NOTE: 1" Blue Board is shown. Other acceptable means to protect the waterproof membrane, per the Tamko TW-60 Product Data sheet, Include:

- Asphalt composition boards
- Cellular polystyrene insulation
- Fan-folded extruded polystyrene insulation
- Plastic drainage panels

12. Apply Tamko TWM-1 mastic to the edge of the 10" wide protection board (Fig. 7.23).
13. The joint is complete and ready for backfill.
14. Using Superior Sealant, apply the interior bead. Be sure to tool the bead after applying.



Figure 7.22



Figure 7.23

8. END OF JOB PROCEDURES

Quality Control and Finished Appearance

- Verify that all panel/wall measurements are within tolerance.
- Verify that all panel connections have been properly completed.
- Inspect panels for defects and make all necessary repairs.
- Inspect all interior & exterior joints to ensure that sealant has been properly applied and tooled.
- Verify or drill 1/2" holes through Bond Beam within 12" from corners for sill plate attachment.
- Remove all bracing material from doors and windows.
- Remove excess packing.
- Be sure that all trash and tools have been removed from the jobsite.

Paperwork and Items to Leave on Jobsite

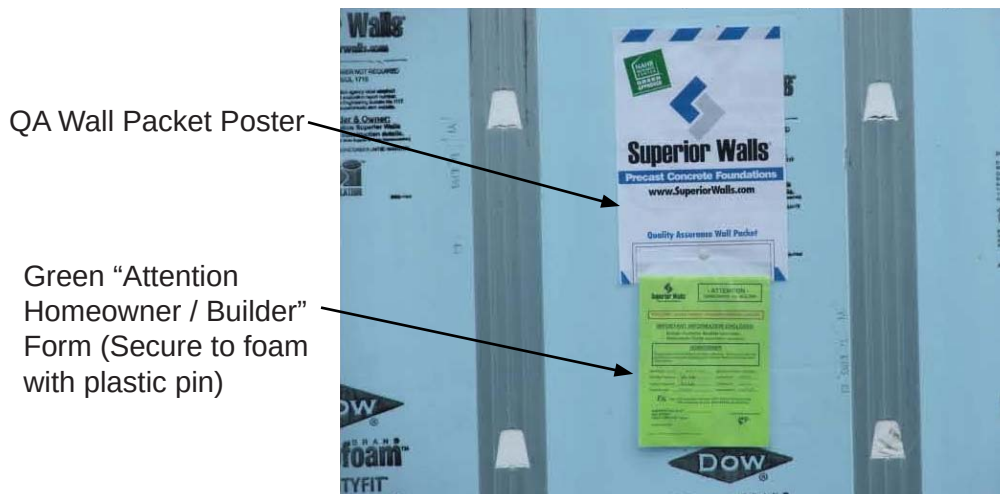
- Leave adequate supply of Coil Bolts for fastening sill plate above window/door headers.
- Leave two extra tubes of sealant for builder use.
- Place orange Stop Stickers on Bond Beam at opposite ends of the foundation.
- Attach a Quality Assurance Wall Packet Poster to the foam insulation at the center of the longest panel between two studs at mid-height.
- Place copy of the *completed* GREEN "Attention Homeowner/Builder" form in the Wall Packet.
- Attach Wall Packet to the QA Wall Packet Poster by fastening to the Blue Board with plastic pin in bag.

Orange
Stop Sticker



NOTE: Completion of the green Homeowner/Builder form is required for product identification by the International Code Council Evaluation Service. The crew chief is responsible for completing this form and for properly hanging it in the wall packet.

Important notice: The SWA Installation Inspection is the last thing the crew chief will do before leaving the job site. The installation is now complete, and your workmanship will be presented to the builder, the homeowner, and others. It is of critical importance that this report is done completely and accurately. If you are the one completing this report, then the awesome responsibility of Quality Assurance is on your shoulders.



*"Taking pride in your work today
will send more work your way
tomorrow."*

Installation Tolerances

At the completion of the installation, verify that the panels are within the following tolerances.

- o Wall Lengths: $\pm 1/2"$
- o Level:
 - Each Panel $\pm 1/8"$ to Adjacent Panel
 - Entire Panel Installation $\pm 3/8"$ from Established Benchmark
- o Wall Plumb: $\pm 1/4"$ Top to Bottom
- o Diagonals: $\pm 1/2"$

Verifying Dimensions

- A steel tape measure is recommended when verifying dimensions. Tape measures that are constructed of certain fabrics can stretch and therefore may not provide an accurate reading.
- In addition to verifying dimensions, each wall must also be straight. A string line can help to indicate if an adjustment is necessary.



3-4-5 Procedure

When checking diagonal measurements, it is important to remember that correct diagonal measurements do not always ensure that the foundation is square. It is wise to use the 3-4-5 method to ensure that corners are square.

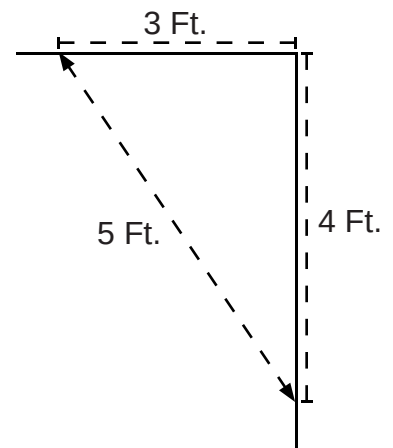
1. Measure 3 Ft. from the corner and mark that spot.



2. Then, from the same corner, measure 4 Ft. on the other wall, and mark that spot.



3. Then measure the distance between the two marks. If the distance is 5 Ft., this means the corner is square.



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9. SAFETY ISSUES

Superior Walls of America urges you to maintain a safe working environment. The protection of the health and safety of everyone on your jobsite needs to be your primary concern.

Construction work can be particularly hazardous and involve many potential areas of concern. Personal protective equipment and other precautions are essential for a safe construction work environment.

We encourage you to:

- Work to *prevent* accidents and injuries
- Understand and obey requirements of environmental and occupational health and safety laws and regulations
- Increase safety awareness
- Not stand in a pinch area when loads are being transferred or lowered
- Not ride on a load or sling
- Not walk or work under any raised loads
- Not place hands or feet under a raised load
- Not engage in horseplay
- Not walk on top of an icy wall
- Always wear a hard hat when the crane is in operation
- Wear face protection when using grinding equipment and saws
- Wear hearing protection when using chain saws, concrete saws and other loud equipment
- Wear eye protection when using power tools such as drills, grinders and saws
- Wear appropriate foot wear (no sneakers or sandals)
- Wear clothes that will not snag
- Enforce the Controlled Access Zone (CAZ)
- Know where the fire extinguisher is kept
- Know where the first aid kit is kept
- Know the phone numbers needed in case of emergency
- Know the location of the job site in case of emergency
- Never release the crane from a panel until it is bolted or braced
- Inspect all lifting equipment such as chains, slings and straps before use
- Inspect all ladders before use
- Not attach panels to the crane in high wind conditions
- Never raise the boom of the crane when the possibility of lightning exists
- Observe fall protection requirements
- Watch for falling objects
- Report unsafe working conditions to your supervisor
- Report all accidents and near accidents immediately to your supervisor
- Investigate all accidents and near accidents in order to prevent a recurrence
- Use traffic cones when necessary
- Keep updated Material Safety Data Sheets (MSDS) in truck
- Store gasoline and other flammable liquids in original containers or in approved containers with self-closing lids
- Check lights on trailer
- Not drive when fatigued
- Be advised that the consumption of alcohol or use of illegal drugs is prohibited
- Fasten items securely to truck or trailer
- Educate all personnel regarding OSHA regulations
- Have regularly scheduled safety meetings

Safety is everybody's business!!

FALL PROTECTION PLAN

Even though OSHA requires that some construction crews adhere to a Fall Protection Plan, installers of Superior Walls are exempt from using conventional Fall Protection. (Conventional Fall Protection consists of nets, halters, etc.) The exemption is based upon the fact that conventional Fall Protection Plans are not feasible when installing Superior Walls. There are, however, two requirements of all Superior Walls Installation Crews:

1. Keep a copy of the two page document on Pg. 53 & 54 on file at each franchise office. This document serves to clarify the infeasibility of Conventional Fall Protection, and may be needed in the case of an OSHA investigation.
2. Fill out the Fall Protection Plan on Pg. 55 and keep it in the Crew Truck.
A new form needs to be filled out and kept on each job site.

In addition to these requirements, Superior Walls of America strongly recommends that all Installation Personnel are properly trained in safety measures that prevent falls.

Standard Interpretations

04/20/2004 - Alternative fall protection for leading edge work during precast concrete erection

Standard Number: [1926.501\(b\)](#); [1926.501\(b\)\(12\)](#); [1926.502\(k\)](#)

OSHA requirements are set by statute, standards and regulations. Our interpretation letters explain these requirements and how they apply to particular circumstances but they cannot create additional employer obligations. This letter constitutes OSHA's interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. Also, from time to time we update our guidance in response to new information. To keep apprised of such developments, you can consult OSHA's website at <http://www.osha.gov>.

April 20, 2004

Mark Monson
St. Paul Companies
16115 14th Avenue North
Plymouth, Minnesota 55447

Re: Fall protection requirements for employees performing work at the leading edge during precast concrete erection operations.

Dear Mr. Monson:

This is in response to your February 13, 2004, letter to the Occupational Safety and Health Administration (OSHA) regarding fall protection requirements under 29 CFR Part 1926 Subpart M (Fall Protection) for workers at the leading edge during precast concrete erection operations.

We have paraphrased your questions below:

Question: Does 29 CFR Part 1926 Subpart M establish that use of a fall arrest system ("tying-off") is considered a greater hazard than implementing a controlled access zone (CAZ) when performing work at the leading edge during precast concrete erection operations?

Answer:

No. As explained below, the standard does not establish that conventional fall protection poses a greater hazard than use of a CAZ when performing work at the leading edge during precast concrete erection operations. However, OSHA has a compliance policy, based on enforcement priorities, that permits the use of alternative measures for this work without having to first demonstrate that conventional fall protection is infeasible or creates a greater hazard.

Title 29 CFR 1926.501(b)(12) states:

Precast concrete erection. Each employee engaged in the erection of precast concrete members (including, but not limited to the erection of wall panels, columns, beams, and floor and roof "tees") and related operations such as grouting of precast concrete members, who is 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems, unless another provision in paragraph (b) of this section provides for an alternative fall protection measure.

Exception: **When the employer can demonstrate that it is infeasible or creates a greater hazard to use these systems**, the employer shall develop and implement a fall protection plan which meets the requirements of paragraph (k) of 1926.502.

NOTE: There is a presumption that it is feasible and will not create a greater hazard to implement at least one of the above-listed fall protection systems. Accordingly, the employer has the burden of establishing that it

is appropriate to implement a fall protection plan which complies with §1926.502(k) for a particular workplace situation in lieu of implementing any of those systems. [Emphasis added.]

This provision clearly states that the use of conventional fall protection for leading edge precast concrete erection work is presumed to be feasible and presumed not to create a greater hazard. It specifically places the burden on the employer to demonstrate infeasibility or greater hazard before alternative means of protection may be used.

Although Appendix E gives **sample** reasons that **may** be used to show infeasibility or greater hazard, §1926.501(b)(12) does not permit the employer to use an Appendix E plan unless it has made a demonstration that, in the specific instance in question, conventional fall protection would be infeasible or present a greater hazard.

The preamble to Subpart M also reflects the Agency's view that such systems are presumed not to create a greater hazard when used for this work:

The new provision [§1926.501(b)(12)] requires employers who can demonstrate that the use of conventional fall protection systems would be infeasible or would create a greater hazard to implement a fall protection plan that complies with §1926.502(k) of the final rule . . . The Agency considers the implementation of a fall protection plan, outlining alternative fall protection measures, to be a "last resort," allowed only where the other options for fall protection have been exhausted. [Volume 59 of the **Federal Register**, page 40692, August 9, 1994.]

In sum, the plain language of §1926.501(b)(12) states an explicit preference for use of conventional fall protection (fall restraint or fall arrest, safety nets, or guardrails) instead of alternative fall protection measures such as a CAZ or safety monitoring system. "[There is a presumption that it is feasible and will not create a greater hazard to implement at least one of the above-listed fall protection systems [reference to those listed in §1926.501(b)(12)]." Furthermore, the preamble also indicates this preference when it explains that implementation of a fall protection plan, outlining alternative fall protection measures, is considered a "last resort," and permitted only where the other options for fall protection have been "exhausted."

On [July 12, 1995](#), [Deputy Assistant Secretary James Stanley issued a Memorandum \(Enforcement Policy\) to Regional Administrators](#) ("Stanley memo") addressing whether employers may use an alternative fall protection plan in accordance with Appendix E of the Standard without the need to justify at each site the infeasibility or greater hazard of conventional fall protection. In relevant part, the Stanley memo, states:

To eliminate the need for contractors to repeatedly make the same arguments and demonstrations at each project site with regard to infeasibility or greater hazard, OSHA will accept the reasons provided in the sample fall protection plan as meeting the plan justification requirements of the standard.

Likewise, the alternative procedures, when performed in accordance with the sample fall protection plans contained in Appendix E, are deemed as meeting the intent of the fall protection requirements of Subpart M. Only those employers who either fail to provide conventional fall protection, or fail to develop and follow a fall protection plan (such as but not limited to the sample fall protection plans in Appendix E) should be issued a citation for failure to provide fall protection. In addition, fall protection plans need to be site specific only to the extent that they address the fall hazards present at that site. One plan can cover several sites if similar conditions exist.

The Stanley memo states the current compliance policy that permits employers to use the alternative fall protection methods in Appendix E without having to meet the Subpart M burden of first demonstrating infeasibility or greater hazard. That compliance policy permits the Agency to direct its enforcement resources to issues that the Agency currently believes have higher priorities than demonstrations of greater hazard in leading edge precast erection. That memo, however, has not amended §1926.501(b)(12); such an amendment could only be made through rulemaking.

If you need additional information, please contact us by fax (202-693-1689) at: U.S. Department of Labor, OSHA, Office of Construction Standards and Guidance. You can also contact us by mail at U.S. Department of Labor, OSHA, Office of Construction Standards and Guidance, Room N3468, 200 Constitution Avenue, N.W., Washington, D.C. 20210, although there will be a delay in our receiving correspondence by mail.

Sincerely,

Russell B. Swanson, Director
Directorate of Construction

FALL PROTECTION PLAN FORM

Location of Job: _____
Installing Company: _____
Date Plan Prepared
or Modified: _____
Plan Prepared By: _____
Plan Approved By: _____
Plan Supervised By: _____

1. _____ is dedicated to protecting its employees from injuries. This document shall serve to ensure that all employees are informed and trained with regard to the Fall Protection Plan specific to this job. It is the responsibility of the Crew Chief, who will also fill the role of Competent Person and Safety Monitor, to implement this Fall Protection Plan, and to continue to enforce safety policy procedures. It is the responsibility of each employee to follow all safety procedures as instructed by the Crew Chief, and to report any accidents or unsafe conduct immediately. Any changes to this Fall Protection Plan must be approved by the Crew Chief.
2. Due to the nature of the work involved with the installation of precast concrete foundations, conventional fall protection systems are not feasible. Therefore, the following safety procedures shall be followed.
 - a. The maximum number of workers to be monitored by one Safety Monitor is six (6). The following are designated as trained installers and shall be permitted to enter the Controlled Access Zone without the use of conventional fall protection:

Safety Monitor (Crew Chief):
Designated Installer:
Designated Installer:
Designated Installer:
Designated Installer:
Designated Installer:
Designated Installer:

The above individuals have been trained to observe the following safety regulations:

1. Hard hats must be worn at all times while the crane is in operation.
2. Walking on top of the foundation requires wearing proper work shoes, constant vigilance where stepping and watching for the other employees in similar situations.
3. Respond immediately to the Crew Chief, serving as the Competent Person in the CAZ, who will be warning you of any potential hazards.
4. Keep within the vision of the Crew Chief during the period when working above six (6) feet.
5. Report any close calls, safety hazards or accidents to the Crew Chief immediately.
6. Review safety procedures daily before starting work.
7. Be familiar with all safety procedures that are contained in the Superior Walls Installation Manual.

The Duties of the Crew Chief are:

1. Ensure that all Designated Installers are aware of potential hazards.
2. Warn employees when they appear to be unaware of a potential hazard
3. Always be located where visual observation of the job and all workers is possible. Do not allow other responsibilities to interfere with monitoring.
4. Be familiar with all safety procedures that are contained in the Superior Walls Installation Manual.

USDOT REGULATIONS

USDOT – Your crew truck needs to be labeled with a USDOT number if the truck crosses a state line, and if your GVW is 10,000 Lbs. or more. To obtain a USDOT number, you must complete the MCS-150 (Motor Carrier Identification Report) and a MCS-150A (Safety Certification Application). There is no fee for this. Information and forms can be found on the Federal Motor Carrier Safety Administration website at <http://www.fmcsa.dot.gov/redirect.asp?page=http://safer.fmcsa.dot.gov/>. Their phone # is 800-832-5660.

MATERIAL SAFETY DATA SHEETS REGULATIONS

MSDS – You are required by OSHA to carry Material Safety Data Sheets in your crew truck that identify all hazardous materials that the crew may use during installation. This regulation is enforced by OSHA. Any quantity of hazardous material such as: gasoline, propane, DOW Blue Board, and SWA Sealant require an MSDS. MSDS on DOW Blue Board or SWA Sealant may be found in the 'Document Center' in the Licensee Only section of www.superiorwalls.com. Other MSDS can be obtained from www.msds.com.

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Pre-Installation Jobsite Inspection Checklist

This Checklist is to be completed prior to the day of installation. This can be done by the Salesperson, the Crew Chief, or the Installation Coordinator.

JOB NAME: _____
INSPECTED BY: _____

JOB NUMBER: _____
DATE: _____

1. Excavation

- ☐ Are the banks properly benched?
- ☐ Is there a minimum of 2 ft. overdig?
- ☐ Is the ramp adequate for transporting equipment?
- ☐ Is the dirt piled a safe distance from the hole?
- ☐ Are the trenches at least 5' wide?

Comments: _____

2. Crushed Stone Footing

- ☐ Is the stone the proper size?
- ☐ Is the stone the proper depth?
- ☐ Has stone been placed properly so it extends past the outside of the wall by at least 12"?
- ☐ Has all the stone been placed on virgin soil?

Comments: _____

3. Drain

- ☐ Is the drain pipe the proper size?
- ☐ Has the drain been placed at least 12" from the required wall location?
- ☐ Has the drain been directed to either a sump or to daylight?

Comments: _____

4. Corner Pin

- ☐ Do the corner pins clearly define the builder's intent for the foundation placement?

Comments: _____

5. Crane and Truck Access

- ☐ Is there solid ground for the crane pad?
- ☐ Is the crane pad far enough away from the hole?
- ☐ Is the crane pad level?
- ☐ Will the crane pad location allow the crane to reach far enough to set all panels?
- ☐ Are there any overhead obstructions?
- ☐ Is the spot provided for the trucks large enough and level?
- ☐ Is the driveway adequate for the crane and trucks?

Comments: _____

6. Miscellaneous

- ☐ Have toilet facilities been provided for the installation crew?
- ☐ Are the directions to the site accurate and available for the crane/truck drivers and the crew?

Comments: _____

Please list any items that the Set Crew needs to be made aware of:



Superior Walls® Repair Report

This Repair Report may be used to document the repair of a damaged or defective panel.

JOB NAME: _____

BUILDER: _____

DATE OF INSTALLATION: _____

DATE OF REPAIR: _____

MANUFACTURING PLANT: _____

INSTALLATION FOREMAN: _____

REPAIR CREW: _____

1. Description of Problem: _____

Loss Attributed to:

☐ Customer Blueprint

☐ Incorrect Layout

☐ Install Crew

☐ Sales Drawing

☐ Production Crew

☐ Contract (Error/Omission)

☐ CAD Drawing

☐ Loading Crew

☐ Other

☐ Production Drawing

☐ Transporting Load

2. Description of Repair: _____

3. Materials used for Repair: _____

4. Comments: _____

5. Total Hours involved in Repair: _____



INSTALLATION INSPECTION FORM

This Form is designed to simplify and expedite the post-installation inspection by the Superior Walls Certified Installer.

Certified Installer: _____ Certification #: _____
Licensee: _____ Installation Date: _____

Job Name and/or Number: _____
Location of Job: _____

GENERAL (Check all that apply)

1. Type of Wall: ☐ Xi ☐ R-5 ☐ Ui ☐ Other _____
2. Size of Wall: ☐ 10' ☐ 9' ☐ 8' ☐ 4'8" ☐ 4' ☐ Other _____
3. Total Linear Feet _____
4. Number of Panels _____
5. Set Time _____ + Travel Time _____ + Down Time _____ = Total Time _____
6. Mileage _____
7. Temperature _____ Weather Conditions _____
8. Sealant Batch # _____
9. Job Site Sign @ Site? ☐ Yes ☐ No
10. Describe any adjustments that the Installers needed to make due to improperly prepared job site. Record time spent making these adjustments. _____

EXTERIOR INSPECTION

1. Exterior Sealant

Yes No NA

- ☐ ☐ ☐ All Exterior Joints have Sealant Applied
☐ ☐ ☐ Dirt, Debris, and Loose Concrete Appear to have been Removed before Sealant Application
☐ ☐ ☐ Exterior Sealant Properly Tooled

Comments: _____

2. Exterior Patches and Repairs

Yes No NA

- ☐ ☐ ☐ Any Required Exterior Patches and Repairs Completed
☐ ☐ ☐ Exterior Voids, Honeycomb, or Exposed Rebar

Comments: _____

3. Measurement Tolerances

Yes No NA

- ☐ ☐ ☐ Wall Lengths (+/- 1/2")
☐ ☐ ☐ Level (Each Panel +/- 1/8" to Adjacent Panel; Entire Foundation +/- 3/8" from Established Benchmark)
☐ ☐ ☐ Plumb (+/- 1/4" Top to Bottom)
☐ ☐ ☐ Diagonals (+/- 1/2")

Comments: _____

4. Ledges (Brick / Stone / Support)

Yes No NA

- ☐ ☐ ☐ Acceptable Appearance
☐ ☐ ☐ Correct Size
☐ ☐ ☐ Correct Location
☐ ☐ ☐ Wall Ties Present (if required)
☐ ☐ ☐ Support Ledge Shims (Min. 5,000 PSI Plastic)
☐ ☐ ☐ Intersecting Walls have Proper Support (5'-0" Max / 10'-0" with One Support)

Comments: _____

5. Crushed Stone Footing

Yes No NA

- ☐ ☐ ☐ 1/2" Clean Crushed Stone

Comments: _____

6. Drain Pipe

Yes No NA

- ☐ ☐ ☐ 4" Perforated Drainage Pipe Present
☐ ☐ ☐ Pipe Located at least One Foot (12") from Panel

Comments: _____

7. Excavation / Backfill

Yes No NA

- ☐ ☐ ☐ Minimum 2'-0" Overdig
☐ ☐ ☐ Properly Sloped Grade (Slope Grade minimum of 6" within the first 10'-0")

Comments: _____

8. Exterior Finish

Yes No NA

- ☐ ☐ ☐ Consistent Broom Finish
☐ Other Finish: _____

Comments: _____

INTERIOR INSPECTION

1. Cleanliness of Jobsite

Yes No NA

- ☐ ☐ ☐ "Superior Walls" Trash Present

Comments: _____

2. Interior Sealant

Yes No NA

- ☐ ☐ ☐ All Interior Joints have Sealant Applied
☐ ☐ ☐ Interior Sealant Tooled

Comments: _____

3. Interior Patches and Repairs

Yes No NA

- ☐ ☐ ☐ Any Required Interior Patches and Repairs Completed
☐ ☐ ☐ Interior Voids, Honeycomb, or Exposed Rebar

Comments: _____

4. Bolting / Bracket Connections

Yes No NA

- ☐ ☐ ☐ All Bolting Connections Properly Completed
☐ ☐ ☐ Bolt Pockets Properly Aligned
☐ ☐ ☐ All Bracket Connections Properly Completed
☐ ☐ ☐ Ferrule Inserts Placed in Correct Locations

Comments: _____

5. End of Job Procedures

Yes No NA

- ☐ ☐ ☐ Quality Assurance Wall Packet Poster (P/N 460.10) Installed
☐ ☐ ☐ Wall Packet Filled Out and Attached to QA Wall Packet Poster
☐ ☐ ☐ 1/2" Holes Drilled in Bond Beam within 12" from Corners for Sill Plate Attachment
☐ ☐ ☐ Temporary Bracing Materials Removed
☐ ☐ ☐ Packing Material Removed from Bond Beams and Footer Beams
☐ ☐ ☐ Coil Bolts, Column Pads, and other Accessories left at Site (As Required)
☐ ☐ ☐ At least Two Tubes of Sealant left at Site
☐ ☐ ☐ Orange "Stop" Stickers Applied to Bond Beam

Comments: _____

6. PFS Stickers

Yes No NA

- ☐ ☐ ☐ Proper PFS Stickers Applied to Each Panel

Comments: _____

COMMENTS

OSHA[®] FactSheet

Subpart CC – Cranes and Derricks in Construction: Signal Person Qualification

This fact sheet describes the signal person qualification requirements of subpart CC – Cranes and Derricks in Construction, as specified in 29 CFR 1926.1419 and 1926.1428. Other requirements related to signal persons can be found at 29 CFR 1926.1404, 1926.1430, 1926.1431, and 1926.1441. These provisions are effective November 8, 2010.

When is a signal person required?

A signal person is required when:

- The point of operation is not in full view of the operator (1926.1419(a)).
- The operator's view is obstructed in the direction the equipment is traveling.
- Either the operator or the person handling the load determines that a signal person is needed because of site-specific safety concerns.

What does a signal person need to know?

The signal person is considered qualified if he or she:

- Knows and understands the type of signals used at the worksite.
- Is competent in using these signals.
- Understands the operations and limitations of the equipment, including the crane dynamics involved in swinging, raising, lowering and stopping loads and in boom deflection from hoisting loads.
- Knows and understands the relevant signal person qualification requirements specified in subpart CC (1926.1419-1926.1422; 1926.1428).
- Passes an oral or written test and a practical test.

How does a signal person become qualified?

Employers must use one of the following options to ensure that a signal person is qualified (see 1926.1428).

1. *Third party qualified evaluator.* The signal person has documentation from a third party qualified evaluator showing that he or she meets the qualification requirements.
2. *Employer's qualified evaluator* (not a third party). The *employer's qualified evaluator* assesses the individual, determines the individual meets the qualification requirements, and provides documentation of that determination. This assessment may not be relied on by other employers.

Refer to 1926.1401 for definitions of qualified evaluators.

How will an employer show that a signal person is appropriately qualified?

Employers must make the documentation of the signal person's qualifications available at the worksite, either in paper form or electronically. The documentation must specify each type of signaling (e.g., hand signals, radio signals, etc.) for which the signal person is qualified under the requirements of the standard.

When are signal persons required to be qualified?

The qualification requirements for signal persons go into effect on November 8, 2010.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For more complete information:



U.S. Department of Labor

www.osha.gov

(800) 321-OSHA

DOC 10/2010

OSHA[®] FactSheet

Subpart CC – Cranes and Derricks in Construction: Qualified Rigger

This fact sheet describes the qualified rigger requirements of subpart CC – Cranes and Derricks in Construction, as specified in 29 CFR 1926.1401, 1926.1404, and 1926.1425. These provisions are effective November 8, 2010.

When is a *qualified rigger* required?

Employers must use *qualified riggers* during hoisting activities for assembly and disassembly work (1926.1404(r)(1)). Additionally, *qualified riggers* are required whenever workers are within the fall zone and hooking, unhooking, or guiding a load, or doing the initial connection of a load to a component or structure (1926.1425(c)).

Who can be a *qualified rigger*?

A *qualified rigger* is a rigger who meets the criteria for a qualified person. Employers must determine whether a person is qualified to perform specific rigging tasks. Each *qualified rigger* may have different credentials or experience. A *qualified rigger* is a person that:

- possesses a recognized degree, certificate, or professional standing, or
- has extensive knowledge, training, and experience, and
- can successfully demonstrate the ability to solve problems related to rigging loads.

The person designated as the *qualified rigger* must have the ability to properly rig the load for a particular job. It does not mean that a rigger must be qualified to do every type of rigging job.

Each load that requires rigging has unique properties that can range from the simple to the complex. For example, a rigger may have extensive experience in rigging structural

components and other equipment to support specific construction activities. Such experience may have been gained over many years. However, this experience does not automatically qualify the rigger to rig unstable, unusually heavy, or eccentric loads that may require a tandem lift, multiple-lifts, or use of custom rigging equipment. In essence, employers must make sure the person can do the rigging work needed for the exact types of loads and lifts for a particular job with the equipment and rigging that will be used for that job.

Do *qualified riggers* have to be trained or certified by an accredited organization or assessed by a third party?

No. Riggers do not have to be certified by an accredited organization or assessed by a third party. Employers may choose to use a third party entity to assess the qualifications of the rigger candidate, but they are not required to do so.

Does a certified operator also meet the requirements of a *qualified rigger*?

A certified operator does not necessarily meet the requirements of a *qualified rigger*. Determining whether a person is a *qualified rigger* is based on the nature of the load, lift, and equipment used to hoist that load plus that person's knowledge and experience. A certified/qualified operator may meet the requirements of a *qualified rigger*, depending on the operator's knowledge and experience with rigging.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

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