TITAN HV Slab Forming System

Instructions for use as of October 2010

Fast Setup & Dismantling, Easy to Use
General Safety

Safety is the number one priority at Concrete Support Systems. As a result all of our concrete formwork and shoring products are designed to first be safe, and second to be productive. In order to ensure the safe use of the equipment, all of the personnel on the construction site should be familiar with the contents of this method statement. This document is not meant to cover all potential applications, but a core group of common situations. Should any applications arise that are not specifically described in this document, please contact your Concrete Support Systems representative.

Jobsite safety is your responsibility, and therefore you should schedule regular safety meetings specific to the concrete formwork and shoring setting, concrete placement, stripping and cycling operations. All jobsite personnel should be familiar with and in compliance with all applicable government regulations and codes, including, but not limited to industry safety standards developed and set forth by:

- American Concrete Institute
- American National Standards Institute
- The Occupational Safety and Health Administration
- The Scaffolding, Shoring and Forming Institute

Method Statement Illustrations

The drawings and/or photographs contained in this Method Statement are for illustrative purposes only and often show the product during the erection procedure. Please refer to your erection drawings for specific application design. All local and federal requirements must be followed when erecting formwork and shoring, placing concrete and stripping equipment. If you have any questions regarding your erection drawings, please contact your Concrete Support Systems representative.

Equipment Inspection:

All Main Beam and Secondary Beams should be inspected before each cycle for damage. This includes the inspection of bends, dents, cuts, damaged end caps, broken welds and missing or lose wood inserts. These beams must be removed from inventory and sent for repair.

All post shores should be inspected before each cycle for damage. Careful attention should be paid to the casting collar to ensure that not cracks have been produced by repeated hammer striking. It is important to note that you should NEVER strike the post shore with any type of hammer.
Jobsite Safety

Jobsite safety is the responsibility of the contractor. Safe use or the supplied equipment is critical to the success of your project. As an invested partner, Concrete Support Systems recommends that the following practices be enforced:

1. Make all jobsite personnel familiar with this Method Statement.
2. Make all jobsite personnel familiar and compliant with local and federal codes.
3. Make all jobsite personnel familiar and compliant with industry standards.
4. Unload deliveries in a flat and stable area.
5. Inspect all components and accessories prior to use.
6. Remove any damaged or unsuitable components and/or accessories from the jobsite inventory.
7. Assemble equipment in a safe environment that has easy access for emergency vehicles.
8. Assemble equipment with trained professionals who are well versed in the erection and dismantling of concrete formwork and shoring.
9. Ensure that hard hats, safety glasses, safety vests, steel toe shoes, gloves and hearing protection are used at all times.
10. Regularly check and maintain all component connections, specifically and bolted and/or clamped connections.

General Shoring Safety
Always keep floors clean from debris.
Always ensure that shoring is plumb and properly supported.
Always remove excess concrete build up from equipment.
Always inspect welds and remove items with cracked welds from the inventory.
Always ensure that the post shore pin is fully engaged.
Always use the post shore handle for final grade adjustment.
Never strip the shoring prior to the concrete reaching sufficient strength.
Never use a crane or motorized equipment to break concrete cohesion.
Never drop equipment.
Never strike aluminum equipment with hammers.
Never strike post shores with hammers.
Never remove pin from post shore while the post shore is vertical.
The TITAN HV slab forming system with approved typical calculations consists of lightweight aluminium beams and props (post shores) with drop-head. In contrast to conventional floor slab formwork, the beams of the TITAN HV slab forming system can be hooked together to form a loadbearing grillage which can also transfer horizontal loads to existing supports. Hooking the beams onto the dropheads mounted on the props means it is possible to strike the formwork at an early date – just two to three days after concreting (provided the concrete has reached an adequate strength). All beams are then removed, only the props with the drop-heads and some of the formwork panels remain to support the newly concreted floor slab. An additional system component is the HV panel, which can replace secondary beams and formwork panels and hence speed up the work. We can prepare a formwork proposal for you in our engineering office – based on the typical calculations and geared to your particular requirements. All the details and information on the drawings must be adhered to.

This document is provided by us as the manufacturing company so that you have the necessary instructions to deploy the TITAN HV slab forming system safely and economically. The following instructions are intended to serve merely as a guideline. Once you are familiar with the system, other procedures are conceivable, provided all safety requirements are complied with. Please take the time to read the information given in these instructions for use prior to using the formwork system.

Instructions and training from a person familiar with the system are advisable prior to using the system for the first time. If you require additional information, please contact a qualified person from your company who has been trained by us, or get in touch with your FRIEDR. ISCHEBECK GmbH representative.
Fig. 5: Formwork layout drawing showing the components in formwork layout drawing:

- Drop-head + prop (post shore)
- Main beam \(L = 1150\) mm
- Main beam \(L = 1300\) mm
- Main beam \(L = 1700\) mm
- Main beam \(L = 2300\) mm
- Secondary beam \(L = 1150\) mm
- Secondary beam \(L = 1500\) mm
- Secondary beam \(L = 1700\) mm
- TITAN HV panel
- HV filler strip 900 x 170 x 21 mm
- Safety catch
- HV guard rail post
- TITAN HS guard rail post
- Prop (post shore)
- Timber section
- TITAN U-HV beam clamp

⚠️ Not all the components are used in this example!
Components

1. **Formwork layout drawing**
The formwork layout drawing shows the components required for the formwork. You must begin setting up the slab forming system at the starting point marked on the drawing.

2. **Drop-head**
The drop-head is fixed to the top of a prop (post shore). It forms the connection between main beams and/or secondary beams supporting HV panels.
   - Height: 250 mm
   - Top plate: 100 x 100 mm
   - Base plate: 150 x 120 mm
   - Drop height: 100 mm
   - Weight: 4.7 kg
   - Part No: 01204930

3. **Fixing bracket**
The fixing bracket is only required for attaching the drop-head to a TITAN prop. It is quickly attached and guarantees a secure fixing.
   - Weight: 0.46 kg
   - Part No: 06204990

4. **Speed-thread bolts**
The speed-thread bolts can be used to attach the drop-head to many other standard props (post shores).
   - Weight: 0.1 kg
   - Part No: 01204935

5. **TITAN props (post shores)**
Any of the props from our range can be used for supporting the TITAN HV slab forming system. The TITAN S steel prop and the TITAN HV aluminium prop are given here as examples.

6. **TITAN steel prop**
   - No. 2: height 1.80 – 3.00 m
     - Part No: 01201001
   - No. 3: height 2.30 – 3.50 m
     - Part No: 01201005
   - No. 4: height 2.60 – 4.10 m
     - Part No: 01201009
   - No. 7: height 4.00 – 5.50 m
     - Part No: 01201016
   - Weight: 0.60 kg
   - Part No: 01204955

7. **TITAN HV aluminium prop**
   - TITAN HV: height 1.75 – 3.05 m
     - Part No: 02204927
   - TITAN HV Maxi: height 2.95 – 4.25 m
     - Part No: 01204948
   - Weight: 0.60 kg
   - Part No: 01204954

8. **Safety catch**
This is a restraint clamp for securing cantilevering main beams around the edge of a building. It prevents the beam from coming disengaged from the drop-head and thus ensures better stability, better safety. It can also be used to secure connections between main beams (except between the 2.30 m main beam and other main beams).
   - Weight: 0.60 kg
   - Part No: 01204955

9. **Wall spacer**
The wall spacer is fixed to main beams set up parallel to a wall. It ensures the correct distance between main beam and wall for fitting HV filler strips. Only required in conjunction with the HV panel.
   - Weight: 0.60 kg
   - Part No: 01204954

10. **Positioner**
This is used to position a prop directly beneath a main beam. To do this, the positioner is fixed directly to the underside of the main beam (e.g. at edges with cantilevering main beams).

   - **Positioner 38**
     - For TITAN S props No. 2 and No. 3
     - Weight: 0.1 kg
     - Part No: 06204958

   - **Positioner 50**
     - For TITAN S props No. 4 and No. 7, also TITAN HV aluminium props.
     - Weight: 0.1 kg
     - Part No: 06204959
Components

10 Main beam
This is a main element and together with the props forms the basic framework for setting up the system. Other elements, e.g. HV panels or secondary beams, can be attached to the main beams. The integral timber ground enables easy fixing of formwork panels (e.g. plywood sheathing). The main beams have coloured labels on their sides for distinguishing the different lengths at a glance. These colours match those used on the formwork layout drawing to speed up the work on site.

<table>
<thead>
<tr>
<th>Length</th>
<th>Weight</th>
<th>Grid size</th>
<th>Part No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.15 m</td>
<td>8.5 kg</td>
<td>1.25 m</td>
<td>01204904</td>
</tr>
<tr>
<td>1.50 m</td>
<td>11.2 kg</td>
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<tr>
<td>1.70 m</td>
<td>12.7 kg</td>
<td>1.80 m</td>
<td>01204908</td>
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<td>2.30 m</td>
<td>18 kg</td>
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<td>3.50 m</td>
<td>28.4 kg</td>
<td>3.60 m</td>
<td>01204911</td>
</tr>
</tbody>
</table>

11 Secondary beam
The purpose of the secondary beams is to support the formwork panels. There are fixed in the same plane as the main beams and therefore help to stiffen the entire system. The integral timber ground enables easy fixing of formwork panels (e.g. plywood sheeting).

<table>
<thead>
<tr>
<th>Length</th>
<th>Weight</th>
<th>Grid size</th>
<th>Part No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.15 m</td>
<td>3.7 kg</td>
<td>1.25 m</td>
<td>01204915</td>
</tr>
<tr>
<td>1.50 m</td>
<td>5.0 kg</td>
<td>1.60 m</td>
<td>01204918</td>
</tr>
<tr>
<td>1.70 m</td>
<td>5.3 kg</td>
<td>1.80 m</td>
<td>01204921</td>
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</table>

12 HV panel
The HV panel consists of a lightweight aluminium frame and a GFRP sheet. It includes a quick-release support at one end which enables it to be installed and removed easily and safely from below, thus speeding up setup and striking.

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Grid size</th>
<th>Weight</th>
<th>Part No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.7 m</td>
<td>0.45 m</td>
<td>0.45 x 1.80 m</td>
<td>16.5 kg</td>
<td>01204951</td>
</tr>
</tbody>
</table>

13 HV filler strip
The HV filler strip closes the gaps between HV panels and is also used above main beams at edges.

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Weight</th>
<th>Part No</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9 m</td>
<td>0.17 m</td>
<td>3.8 kg</td>
<td>06204953</td>
</tr>
</tbody>
</table>

14 Formwork panel
Supplied by others!
Always check material thickness! 21 mm
5.1 Preparations for setup

**Adjusting prop lengths**
Set the props (post shores) to the correct height for the formwork. Allow for the height of the drop-head and the thickness of the formwork panel. The height to be set $L$ with a 21 mm formwork panel is equal to the room height $L_H - 271$ mm.

$L = L_H - 271$ mm

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**Fixing drop-head to prop with speedthread bolts**
Fix the drop-head to the prop (post shore) with two speed-thread bolts. To do this, insert the bolts from above and secure them with wing nuts underneath.

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**Fixing drop-head to TITAN prop with fixing bracket**
Fix the drop-head to the prop (post shore) with the fixing bracket.
Components

Setting drop-head to formwork position
Raise the loadbearing plate and the release ring above the pins (1) and then turn the release ring through 45° (2).

Attaching wall spacer to main beam
The wall spacer fixes a main beam parallel to a wall at the correct distance from the wall. Fit the wall spacer into the groove on the underside of the main beam and fix it in place with the wing nut. (Only required in combination with HV panels.)

Preparing the area
1. The area below the floor slab to be cast should be kept clean, clear of building debris and other unnecessary items so that the components for the slab forming system can be moved around in their wheeled storage racks.
2. Gather together the components needed for the slab forming system and store them in their wheeled storage racks. Ensure that suitable working platforms (provided by others) are available for setting up the slab forming system where this is necessary.
Components

15 HV guard rail post
The HV guard rail post is required at edges and is simply inserted into the main beam. It is then easy to erect a safety barrier around the formwork.

Height: 1.32 m
Weight: 8.3 kg
Part No: 01204960

16 HV corner guard rail post
The HV corner guard rail post is required at corners and in areas where the main beams are positioned parallel to edges where there is a risk of falling.

Height: 1.32 m
Weight: 9.5 kg
Part No: 01204961

17 TITAN U-HV beam clamp
It is easy to incorporate the formwork for downstand beams with the U-HV beam clamp. It is suitable for a maximum depth of 800 mm and a maximum width of 830 mm.

Weight: 19.0 kg
Part No: 01204935

18 TITAN HV carbide cleaning scraper
For cleaning the groove in the main beam.

Weight: 0.60 kg
Part No: 06204922

19 TITAN HV carbide concrete scraper
For the easy removal of concrete residue from HV panels.

Weight: 1.56 kg
Part No: 06204920

20 TITAN storage rack “Barelle®”
For the storage and transport of the components on the building site.

Weight: 38 kg
“Barelle®”, painted, part No: 01206001
“Barelle®”, galvanised, part No: 01206002

21 HV panel storage rack
For the storage and transport of HV panels on the building site.

Rack 30 (for 30 HV panels), part No: 01204952
Weight empty/full: 134 kg/629 kg
Rack 14 (for 14 HV panels), part No: 01204953
Weight empty/full: 45.8 kg/276.8 kg

22 Fixed and swivel castors
These castors can be fixed to “Barelles” or HV panel storage racks.

Permissible loading per castor: 4 kN
Fixed castor, part No: 01206010
Weight: 5.87 kg
Swivel castor, part No: 01206011
Weight: 5.95 kg
5.2 Typical setup

You must begin setting up the slab forming system at the starting point marked on the drawing. But you may proceed in any direction from this point.

Ensure correct spacing!
Setting the System

Fig. 17

Set up props (post shores) at the spacing a given below. Tripods or frames may be used to ensure the stability of the first props.

- $a = 1.25\ m$
- $a = 1.60\ m$
- $a = 1.80\ m$
- $a = 2.40\ m$
- $a = 1.25\ m$
- $a = 1.60\ m$
- $a = 1.80\ m$

Fig. 18

Fit the first HV panel in place and slide it beyond the drop-head right up to the wall (max. 150 mm beyond centre of drop-head). Tripods or frames are no longer required for the remainder of the props.
Setting the System

Fit further HV panels until the first bay is complete.

Fig. 19

Attach the next main beam to the drop-head and lift it into place with a prop (post shore). This positions the prop automatically.

Fig. 20

Fit further HV panels until the second bay is complete. Fit the HV panels in such a way that the quick-release supports are all on the same side. That makes striking easier.

Fig. 21
Setting the System

Where a main beam has to cantilever beyond an edge, attach it to the drop-head/prop with the help of a safety catch (cantilever beam restraint clamp).

Insert a positioner into the groove in the underside of the main beam at the desired position (1) and turn it until it is tight (2). The positioner prevents the prop from being displaced (3).

Further cantilevering main beams are set up in the same way. The bay is then completed with HV panels.
Any obstacles encountered are easily incorporated with the help of main and secondary beams. To do this, attach main beams to the left and right of the obstacle (a column in this case), at 90° to the main beams already set up, to serve as trimmers. Attach secondary beams between these trimmers as required.

The use of trimmers enables the TITAN HV slab forming system to be adapted to any plan layout.
Setting the System

Spray release agent onto HV panels and formwork panels prior to concreting!

Attach main and secondary beams as required to complete the corner.

Once the grid of interlocking beams has been set up, insert guard rail posts around the perimeter of the area for safety. Afterwards, lay HV filler strips and formwork panels on the beams. (The formwork panels may be secured with nails, e.g. 2.2 x 40 mm, at a few places if required.) The long sides of formwork panels should not be butt-jointed directly above main beams; cut the formwork panels longitudinally if necessary. Avoiding butt joints above main beams prevents the beams from becoming coated in cement slurry and also eases striking. There may be a risk of falling during setting-up/dismantling; appropriate safety measures must be taken.
Setting the System

Fig. 28

Infinite adjustment to suit room dimensions

Fig. 29

Integrating a column
Setting the System

Wall at an angle to main grid 1

Wall at an angle to main grid 2

Fig. 30

Fig. 31
Setting the System

Fig. 32

Fig. 33
Setting the System

Pre-Set Post Shore Height
Set the drop head to the locked position with a hammer blow to the locking nut. Adjust the post shore to the proper pin hole while the post shore is in the horizontal position. Use the post shore handle to turn cast collar nut for approximate shore height.

Setting the Main Beam
You should begin by building a four post shore tower using the DB 180 Frame, Ledger Frame 180, Tripods or Timber Wedge Clamps. Every 1600 SF of deck installed should be stabilized with a four post shore tower. Main beams should be set in parallel rows and are designed to be hung from the drop head and pushed into final position with the post shore drop head.
Setting the System

Setting the Secondary Beam
Secondary Beams should be installed by dragging the bottom of the beam across the top of the Main Beam until the Secondary Beam securely drops into the Secondary Beam. Avoid locating the Secondary Beam at drop head locations whenever possible, this will improve access to the quick release collar of the drop head during the stripping procedure.

Framing at Column Locations
Shore around columns and other obstacles by ‘straddling’ the column with Main Beams and spanning between Main Beams with lumber fillers.
Setting the System

Lumber Fillers
When required it is suitable to use 4 x 4 lumber as Secondary Beams. The ledger of the Main Beam is 3 ½” below the top of the Main Beam. The lumber should be cut so that the dimensions are +0” and – 1/32” to ensure proper bearing on the Main Beam.

Addressing Jobsite Conditions – ‘Turn and Slide’ Method
When encountering a wall perpendicular to the Main Beam direction, adjusting the length of the shoring is easily accomplished using the ‘turn and slide’ method. Stop the shoring short of the wall, turn the Main Beam direction to run parallel to the wall and slide the Main Beams up to the wall.
Setting the System

Addressing Jobsite Conditions
When encountering a wall parallel with the Main Beams, adjusting the shoring laterally is easily accomplished using the ‘fingering-in’ method. At the obstruction turn the Main Beams to run perpendicular to the obstruction and slide up to the wall.

Plywood Installation
Units of plywood are suitable to be placed on top of properly installed and stabilized shoring. Attach plywood decking to the systems Main Beam and Secondary Beam with a 6 common nail driven at a 45 degree angle.
**Stripping the System**

**Post Shores**

- Adjust the post shores to the appropriate length when they are horizontal.
- Never place your fingers in the holes of the post shore or in the ends of the post shores.
- Never remove a pin from the post shore when the post is in the vertical position.
- Post Shores must be installed completely vertical. The use of a level is recommended for verifying if the post shore is plumb.
- Post shores used as re shore posts must be used in conjunction with spring clips or cross bracing to ensure they remain vertical and in contact with the slab surfaces.
- Post shore extensions must be secured with (4) grade 5 bolts.
- Always retighten post shores to concrete after dropping main beams.

**Bracing Post Shores**

- Cross bracing (Timber Wedge Clamp or DB Frame) must be installed during the erection process.
- You can use the DB 180 frame or use 1x4 or 2x4 lumber material for bracing.
- Always connect at least three post shores together when using lumber bracing.
- Always brace the leading edge of the deck and always brace the stopping points for the day.
- Additional cross bracing is required on slopes and ramps.

**Cantilever Conditions**

- Extra caution must be exercised at cantilevered conditions to avoid fall hazards.
- Warn all jobsite personnel to stay off of cantilevered areas until the installation of the shoring and fall protection is complete.
- Do not load cantilevered Main Beams prior to installing all Secondary Beams, post shores, safety catches, cross bracing, lacing and plywood decking.
- Do not cantilever Main Beams where the adjacent framing and plywood decking is not sufficient to counter the cantilever loads.
- Do not load the Main Beam beyond the allowable design capacity.
- Do not place material or equipment on cantilevered framing areas.
- Always install safety catches on the cantilevered Main Beams.
- Always install adequate cross bracing to stabilize cantilevered conditions.

**Handrail Posts**

- Always take precaution while installing the handrail post and guardrail lumber to prevent fall hazards.
- Do not allow personnel on the deck until shoring installation and fall protection is complete and inspected by the site safety manager.
- Do not exceed 8’ center to center spacing for handrail installation.
- Always ensure that the handrail bracket is fully seated into the Main Beam end clip.
- Always use 2 x 4’s for the guardrail lumber.
- Always secure the lumber to the handrail pockets.
- Always lap the lumber at the location of a handrail upright.
- Always ensure that all fall protection installed is OSHA compliant.
Stripping the System

NOTES:
1. EXTRA CAUTION MUST BE EXERCISED AT CANTILEVERED CONDITIONS TO AVOID FALL HAZARDS, KEEP ALL PERSONNEL ON JOBSITE TO STAY OFF CANTILEVERED AREAS UNTIL INSTALLATION AND FALL PROTECTION IS COMPLETE.

2. AVOID LOADING CANTILEVERED MAIN BEAM PRIOR TO INSTALLING ALL SECONDARY BEAMS, POST SHORES, POSITIONERS, SAFETY CATCHES, CROSS BRACING LACING AND ADJACENT PLYWOOD.

3. AVOID CANTILEVERING MAIN BEAMS WHERE ADJACENT FRAMING PLYWOOD IS NOT SUFFICIENT TO BALLAST LOAD AT CANTILEVER.

4. AVOID POST SHORES UNDER MAIN BEAMS WITHOUT POSITIONERS.

5. AVOID LOADING CANTILEVER BEYOND ITS DESIGN CAPACITY.

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TYPICAL CANTILEVERED PERIMETER W/ 11'-6" MAIN BEAM

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TYPICAL CANTILEVERED PERIMETER W/ 5'-7" MAIN BEAM
Stripping the System

**Typical Perimeter Bracing**

- Block and nail brace at intersection.
- Use wedge clamp at location.

**Typical Interior Bracing**

- Note: if one only one crossbrace is engaged by the center wedge, then nail, unclamped brace to clamped brace.
- Use wedge clamp at location.

**Typical Lacing Detail**

- Use wedge clamp at location.

**Notes:**
1. Use 2x4 lumber for bracing.
2. Cross braces must span at least 3 post shores.
3. Cross braces must be installed full height, top of one shore to bottom of other.
4. Cross braces must be secured with wedge clamps at all indicated locations.
5. See lacing detail for post shore lacing.

**Cross Brace Guidelines:**
1. Set crossbracing at all exterior and interior pour boundaries, the perimeter of loading areas, and all beam locations.
2. Crossbracing must be set every other row of shores in both directions at a minimum.
3. Crossbracing along wall is not a requirement.
4. Additional crossbracing is required on slopes and ramps.
Stripping the System

NOTES:

1. PRECAUTIONS MUST BE TAKEN WHILE INSTALLING SAFETY POST AND GUARDRAIL TO PREVENT FALL HAZARDS.

2. NO PERSONNEL ALLOWED ON DECK UNTIL SHORING INSTALLATION AND FALL PROTECTION IS COMPLETE AND INSPECTED BY A SAFETY MANAGER. COMPLETE SHORING INSTALLATION INCLUDES ALL NECESSARY CROSS BRACING/LACING, SAFETY CATCHES, POST SHORES AND POSITIONERS, AND DECKING.

3. SAFETY POSTS MUST NOT EXCEED 8" OC SPACING. SAFETY POSTS MUST BE FULLY SKEWED INTO MAIN BEAM END CAP AND NAILLED TO DECKING / MAIN BEAM TO PREVENT UPLIFT.

4. GUARDRAILS MUST BE MADE FROM 2x4'S. GUARDRAILS MUST BE SECURED TO SAFETY POST POCKETS WITH NAILS. LAPPING OF 2x4'S MUST TAKE PLACE AT THE SAFETY POST.

5. ALL WALKWAY AREAS MUST BE DECKED AND HAVE FALL PROTECTION INSTALLED.

6. IN THE EVENT THAT DROP SHORE SAFETY POSTS CANNOT BE USED BECAUSE OF JOB CONDITIONS, PROPER OSHAAAPPROVED FALL PROTECTION MUST BE INSTALLED AND USED BY CONTRACTOR.
Stripping the System

Typical Turn and Slide Detail

Typical Finger-In Detail
Stripping the System

Typical Shoring Around Column

Typical Shoring Under Beam

Typical Outside Corner Detail
6. Checklist prior to concreting

Make sure that:

☐ the system has been set up according to the formwork layout drawing.
☐ the props (post shores) have all been set up correctly and are secure.
☐ the props have been set to the correct height.
☐ the release rings on the drop-heads are all securely in position.
☐ timber sections provided on site are positioned at the correct spacing and cannot work loose.
☐ the permissible spans of the formwork panels have not been exceeded.
☐ damaged parts have been removed and replaced.
☐ the entire formwork setup is secured against overturning (e.g. due to wind or horizontal loads during operations).
☐ the relevant safety rules currently valid in the respective country of use have been complied with.
☐ a suitable release agent has been applied to the formwork panels (prior to placing the reinforcement).

⚠️ After concreting, clean off the underside of the formwork panels with a water hose!
Stripping the System

7. Dismantling

You can start stripping the formwork at any position!

7.1 Main and secondary beams
Use a hammer to undo the release ring. Turn it through approx. 45° so that it falls down together with the loadbearing plate.

Once the loadbearing plate has been lowered, the beams attached to it also drop.

Safety Note:
Once Drop Head is lowered it is important to ensure post shore is snug to concrete.

After all the drop-heads around one bay have been lowered, it is possible to remove the beams. To do this, lift one end and then lower the other end.
Stripping the System

All other beams can then be removed.

7.2 HV panel and main beam
Use a hammer to undo the release ring. Turn it through approx. 45° so that it falls down together with the loadbearing plate.

Once the loadbearing plate has been lowered, the main beams and HV panels attached to it also drop.
Stripping the System

Lift the HV panel at the end with the quick-release handle (1) and then rotate the quick-release mechanism (2). Please note that the quick-release support is at one end only. Please lift this end!

Actuating the quick-release mechanism creates a space so that the HV panel can be lowered from the beam.

Remove the HV panels one by one.
Stripping the System

Once the HV panels and/or beams have been removed, only the props (post shores) remain. Only the parts supported directly by the props, in this case HV filler strips, but sometimes formwork panels, remain in place below the newly concreted floor slab.

Raise the release ring of the drop-head to the formwork position again and secure with a hammer-blow (see also p. 9, Fig. 12).
8. Transport and storage

8.1 Packaging units
Check the delivery of components for completeness immediately upon arrival. The packaging units should be unloaded directly where they are to be used later. It can be assumed that a complete packaging unit contains the following components upon delivery:

Drop-head:
210 pcs. in mesh box

Main beam:
1.15 m 24 pcs. stacked
1.70 m 24 pcs. stacked
3.50 m 24 pcs. stacked

Secondary beam:
1.15 m 64 pcs. in bundle
1.70 m 64 pcs. in bundle

HV panel:
30 pcs. in storage rack 30
14 pcs. in storage rack 14

HV filler strip:
160 pcs. in mesh box

Accessories:
Supplied in sack or mesh box

Wheeled storage rack ("Barelle") filled with secondary beams. The use of such a rack enables components to be easily transported across the building site.

A storage rack 14 holds up to 14 HV panels. A storage rack 30 holds up to 30 HV panels. Castors can be fitted to these storage racks for easy transport. Like the "Barelle", these racks can also be lifted by a crane or transported with a fork-lift truck.
“Barelles” can be used for transport on a building site. Castors can be fitted to these so that they can also be moved around manually on the building site.

8.2 Transport and storage on the building site

Every building site should include a yard for setting up, adjusting and dismantling the TITAN HV slab forming system (e.g., fixing drop-heads, setting prop heights, etc.). Store all components neatly arranged in “Barelles” or mesh boxes, sorted according to type of product.

“Barelles” can themselves be stacked to save space: max. 5 pcs., one above the other.

For easy transport on the building site, full “Barelles” on castors should not be stacked more than 2 high.

The permissible load on the castors may not exceed 4 x 4 kN.

Further information and details can be found in the TITAN “Barelle®” brochure.

A “Barelle®” can be unloaded from an HGV and transported around the building site with the help of a sling (crane) or a fork-lift truck.

Attach the hooks of the sling to the lifting eyes at the corners at the base of the “Barelle®”.
9. Care, cleaning, repairs

Check and maintain all components on an ongoing basis. Store them in a clear arrangement.

Clean off any concrete residue as soon as possible with water. Clean HV panels and filler strips with a hot-water high-pressure cleaner (water pressure < 150 bar, rotating nozzle, clearance to component > 150 mm)

Clean off dried-on concrete residue carefully with a suitable scraper.
Spray HV panels with release agent prior to use.

Only use components that are in a proper functioning condition.
Reject damaged components and replace them with flawless ones.
Use only ISCHEBECK original parts for any repairs. Repairs may only be carried out by the manufacturer owing to the necessary knowledge and skills required.

10. Returning hired components

10.1 Cleaning
Clean all components as described in section 9. “Care, cleaning, repairs” before you group them into packaging units and load them onto an HGV.
Do not coat HV panels with release agent prior to returning them.

10.2 Packaging units
Group the components together as described in section 8.1 “Packaging units”.

In addition, sort the components according to the following criteria:
- undamaged
- damaged
- scrap

10.3 Loading an HGV
Load the HGV in such a way that it can be unloaded with a fork lift truck.

- Stack no more than 3 “Barelles” on top of each other and place no more than 2 next to each other on the HGV.
- Stack no more than 2 mesh boxes on top of each other and place no more than 2 next to each other on the HGV.
- Stack no more than 3 stacks of beams on top of each other (depending on height of HGV) and place no more than 2 next to each other on the HGV.
- Place no more than 2 racks of 30 panels next to each other on the HGV (do not stack on top of each other).
- Stack no more than 2 racks of 14 panels on top of each other and place no more than 2 next to each other on the HGV.
The purpose of this document is to provide, you the customer, a set of shipping and receiving guidelines so that all parties can effectively inspect and verify all equipment. We realize that safety and productivity are key components in the success of your business. It is imperative that any equipment shipped to or from Concrete Support Systems is loaded properly in an effort to reduce accidents and ensure an accurate account.

Shipping From CCS Yard:
The CCS office prepares an equipment order from the quantity survey posted on the approved shop drawing(s). The order shall include the following:
- Project Name & Description
- Customer name, address, jobsite phone & contact name
- Delivery dates(s)
- Equipment quantities (including summary quantities for consecutive orders and backorders)

• The truck shall be loaded as ordered, ensuring that:
  - All equipment is bundled properly
  - All equipment is in good working order
  - All equipment is counted and recorded accurately

• The CSS yard shall prepare an accurate Shipping Report(s) and advise the CSS office of any equipment discrepancies from original order(s)

• Prior to shipment, the Logistics Manager must review all loads as follows:
  - Verify that all Barellas are bundled properly
  - Verify that all Barella counts for Beams and Post Shores
  - Take pictures of loaded truck with digital camera
  - Review Shipping Report to verify accuracy and sign report acknowledging same

• Provide copies of signed Shipping Report for driver and customer
• Forward signed Shipping Reports and digital picture files to CSS office
• Ensure loads are under the height of 13’ 6” and within weight limits

Receiving Loads from Customer:
Count all equipment on the truck and provide an accurate Receiving Report. Verify quantities shown on customer’s Shipping Report

• Prior to unloading, the Equipment Supervisor must review all loads as follows:
  - Verify that all Barellas are bundled properly
  - Verify all Barella counts for Beams and Post Shores
  - Take digital pictures of the following:
    - The truck prior to unloading
    - Improperly or partially loaded Barellas
    - Damaged equipment (if any)
  - Review Receiving Report to verify accuracy and sign report acknowledging same

• Forward signed Receiving Report, customers Shipping Report and digital picture files to CSS office. The Equipment Manager shall perform a thorough review of returned equipment within 10-working days of receiving the return load. Equipment designated as damaged shall be identified and placed in a holding area for a period of two weeks following notification to the customer.

• Return & Damage Notification shall be forwarded to the customer in a timely fashion following completion of the review.
Customer Shipping Instructions

- You, the customer, should implement a policy which verifies quantities shipped, both in-coming and out-going. In the event a discrepancy is found in equipment shipped to your jobsite, notify CSS immediately.
- CSS strongly recommends taking pictures of both sides of every load of equipment shipped or received (preferably before the straps are removed).
- Returned equipment should be stacked and banded per the enclosed Bundling Standards.
- When loading trucks to return equipment, the customer should adhere to the following shipment stacking standards:
  - **Aluminum**: Place no more than three (3) Barellas high
  - **Post Shores**: Place no more than two (2) high in any case.
- Do not place Barellas of secondary beams at the end of the trailer. The secondary beams may vibrate out of the Barellas in transit if the banding is not sufficiently tight.
- The customer should provide a completed packing list and bill of lading (manifest) for the shipment. The enclosed EQUIPMENT SHIPPING REPORT may be photo copied and used for this purpose.
- In an effort to maximize freight, CSS recommends using a 48’ trailer with split axle. This configuration can typically accommodate a balanced load (shores & aluminum) of 46,000 lbs. subject to the truck driver’s approval.
- The height of load should be no taller than 13’ 6”
- CSS equipment will not be transferred between projects without CSS’s prior approval. CSS discourages transferring equipment from job to job due to the possibility of accounting and quality control issues.
### Bundling Standards: Secondary Joists 1.15m

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Beam Description</th>
<th>Qty/ Barella</th>
<th>Shore Weight (lbs)</th>
<th>Total Weight w/ Barella</th>
</tr>
</thead>
<tbody>
<tr>
<td>1204915</td>
<td>Secondary 1.15m</td>
<td>109</td>
<td>8.1</td>
<td>966.9</td>
</tr>
<tr>
<td>1206001</td>
<td>2’ 8” Barella</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**IMPORTANT:** Band Beams ONLY at center to avoid Barella damage.

- Band Beams & Barella at each end
- 4 Rows of 22 Beams & 1 Top Row of 21
Bundling Standards: Secondary Joists 1.70m

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Beam Description</th>
<th>Qty/Barella</th>
<th>Shore Weight (lbs)</th>
<th>Total Weight w/ Barella</th>
</tr>
</thead>
<tbody>
<tr>
<td>1204921</td>
<td>Secondary 1.7m</td>
<td>64</td>
<td>12.0</td>
<td>852</td>
</tr>
<tr>
<td>1206001</td>
<td>2' 8&quot; Barella</td>
<td>1</td>
<td>12.0</td>
<td></td>
</tr>
</tbody>
</table>

4 Rows of 13 Beams & 1 Top Row of 12

Band Beams & Barella at each end

IMPORTANT: Band Beams ONLY at center to avoid Barella damage
Bundling Standards: Main Beams 1.15m

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Beam</th>
<th>Qty/Barella</th>
<th>Weight (lbs)</th>
<th>Total Weight w/Barella</th>
</tr>
</thead>
<tbody>
<tr>
<td>1204904</td>
<td>Main 1.15m</td>
<td>39</td>
<td>18.7</td>
<td>814.86</td>
</tr>
<tr>
<td>1206001</td>
<td>Barella 2’ 8”</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Main Beams must be nested. This is done by alternating the beams ”right-side up” and then ”up-side down”
### Bundling Standards: Main Beams 1.70m

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Beam</th>
<th>Qty/Barella</th>
<th>Weight (lbs)</th>
<th>Total Barella Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1204908</td>
<td>Main 1.70m</td>
<td>24</td>
<td>28.0</td>
<td>756</td>
</tr>
<tr>
<td>1206001</td>
<td>Barella 2' 8&quot;</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Main Beams must be nested. This is done by alternating the beams "right-side up" and then "up-side down"
**Bundling Standards: Main Beams 3.5m**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Beam</th>
<th>Qty/ Barella</th>
<th>Weight (lbs)</th>
<th>Total Weight w/Barella</th>
</tr>
</thead>
<tbody>
<tr>
<td>1204909</td>
<td>Main 3.5m</td>
<td>24</td>
<td>58.6</td>
<td>1490.4</td>
</tr>
<tr>
<td>1206001</td>
<td>Barella 2' 8”</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Main Beams must be nested. This is done by alternating the beams "right-side up" and then "up-side down"
Bundling Standards: Main Beams 5.3m

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Beam</th>
<th>Qty/Pallet</th>
<th>Weight (lbs)</th>
<th>Total Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1204912</td>
<td>Main 5.3m</td>
<td>45</td>
<td>88.81</td>
<td>3996.45</td>
</tr>
</tbody>
</table>

Main Beams must be nested. This is done by alternating the beams "right-side up" and then "up-side down"
Bundling Standards: Post Shores

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Post Shore</th>
<th>Barella Height</th>
<th>Qty/ Barella</th>
<th>Weight (lbs)</th>
<th>Total Weight w/Barella</th>
</tr>
</thead>
<tbody>
<tr>
<td>41201205</td>
<td>DB300</td>
<td>3'5&quot;</td>
<td>70</td>
<td>42.0</td>
<td>2940</td>
</tr>
<tr>
<td>41201206</td>
<td>DB350</td>
<td>3'5&quot;</td>
<td>70</td>
<td>50.0</td>
<td>2433.8</td>
</tr>
<tr>
<td>41201207</td>
<td>DB550</td>
<td>2'8&quot;</td>
<td>50</td>
<td>74.2</td>
<td>3793.8</td>
</tr>
</tbody>
</table>

IMPORTANT: Band Shores ONLY at center to avoid Barella damage

Always follow bundling and banding standards to prevent equipment damage and ensure optimal handling.
Bundling Standards: Post Shores

Please make sure to stack Shores lacking Dropheads, alternating so that the Jack is positioned behind the neighboring Outer-Shell of the Shore.

This is done to prevent the Jack from escaping whilst in transit!
### Bundling Standards: Post Shores with Dropheads

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Post Shore w/Drophead</th>
<th>Barella Height</th>
<th>Qty/Barella</th>
<th>Weight w/Drophead</th>
<th>Total Weight w/Barella</th>
</tr>
</thead>
<tbody>
<tr>
<td>41201205</td>
<td>DB300</td>
<td>3'5&quot;</td>
<td>56</td>
<td>51.9</td>
<td>2906.4</td>
</tr>
<tr>
<td>41201206</td>
<td>DB350</td>
<td>3'5&quot;</td>
<td>56</td>
<td>59.9</td>
<td>3354.4</td>
</tr>
<tr>
<td>41201207</td>
<td>DB550</td>
<td>2'8&quot;</td>
<td>40</td>
<td>84.1</td>
<td>3364</td>
</tr>
</tbody>
</table>

7 Rows of 8 Shores

Dropheads atop lower-base row should be turned sideways to allow for Bell Clearance

Post Shore/Drophead combination should be staggered to align with the base-end of Shores.
### Bundling Standards: 2’ Extensions

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Extension</th>
<th>Qty</th>
<th>Weight (lbs)</th>
<th>Total Weight w/ Barella</th>
</tr>
</thead>
<tbody>
<tr>
<td>41201211</td>
<td>2’</td>
<td>140</td>
<td>8.5</td>
<td>1274</td>
</tr>
<tr>
<td>1206004</td>
<td>Extension Rack</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Band each bundle twice; one center band excluding the Barella
- Use ONLY Boarded Barellas for extensions
- 8 Rows of 8 & 1 Top Row of 6
Bundling Standards: HV Props

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Prop</th>
<th>Qty/Barella</th>
<th>Weight (lbs)</th>
<th>Total Weight w/Barella</th>
</tr>
</thead>
<tbody>
<tr>
<td>2204927</td>
<td>HV Standard</td>
<td>30</td>
<td>46.3</td>
<td>1473.1</td>
</tr>
<tr>
<td>1204948</td>
<td>HV Maxi</td>
<td>30</td>
<td>34.0</td>
<td>1102.6</td>
</tr>
</tbody>
</table>

**Band Props to Barella on ends**

**Band Props ONLY in the center to avoid Barella damage**

**DO NOT** leave Dropheads installed onto any HV Props or you will be subject to incur additional labor fees.

4 Rows of 7 & 1 Top Row of 2
Bundling Standards: H2O Girders

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Girder (m)</th>
<th>Qty</th>
<th>Weight (lbs)</th>
<th>Total Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>201.200.0390</td>
<td>3.90</td>
<td>50</td>
<td>39.7</td>
<td>1984.5</td>
</tr>
<tr>
<td>201.200.0490</td>
<td>4.90</td>
<td>50</td>
<td>49.6</td>
<td>2480.5</td>
</tr>
<tr>
<td>201.200.0590</td>
<td>5.90</td>
<td>50</td>
<td>59.7</td>
<td>2985</td>
</tr>
</tbody>
</table>

10 Rows of 5

Band Dunnage with Girder on ends

Band Dunnage with Girder on ends

Band Girders in the Center
### Bundling Standards: Ledger Frames

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Frame</th>
<th>Qty/Bundle</th>
<th>Weight (lbs)</th>
<th>Total Bundle Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2201567</td>
<td>60m</td>
<td>20</td>
<td>12.35</td>
<td>247</td>
</tr>
<tr>
<td>2201568</td>
<td>90m</td>
<td>20</td>
<td>16.54</td>
<td>330.8</td>
</tr>
<tr>
<td>1201569</td>
<td>120m</td>
<td>20</td>
<td>17.2</td>
<td>344</td>
</tr>
<tr>
<td>1201572</td>
<td>180m</td>
<td>20</td>
<td>21.39</td>
<td>427.8</td>
</tr>
<tr>
<td>1201573</td>
<td>240m</td>
<td>20</td>
<td>29.77</td>
<td>595.4</td>
</tr>
<tr>
<td>1201574</td>
<td>300m</td>
<td>20</td>
<td>33.96</td>
<td>679.2</td>
</tr>
</tbody>
</table>

- **20 Frames per Bundle**
- **Band Frames on ends**
- **Nest Frames within bundle**
Aluminum 225 Stringer Beams

03204214  Alu Beam TITAN 225 x 1.80m 5'-11"
03204213  Alu Beam TITAN 225 x 2.40m 7'-11"
03204206  Alu Beam TITAN 225 x 3.00m 9'-10"
0225B390  Alu Beam TITAN 225 x 3.90m 12'-10"
03204218  Alu Beam TITAN 225 x 4.80m 15'-9"
03204209  Alu Beam TITAN 225 x 6.00m 19'-8"
03204227  Alu Beam TITAN 225 x 7.90m 25'-11"

Packaged 30 Pieces per Bundle
Package horizontal  5 x 6

51.27 [1'-9"]
114.07 [3'-10"]
### Bundling Standards: Saddle Beams

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Saddle Beam</th>
<th>Qty/Bundle</th>
<th>Weight (lbs)</th>
<th>Total Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2042.90018</td>
<td>1.80m</td>
<td>9</td>
<td>53.0</td>
<td>477</td>
</tr>
<tr>
<td>940.033.6180</td>
<td>1.80m</td>
<td>9</td>
<td>53.0</td>
<td>477</td>
</tr>
</tbody>
</table>

- **Band Saddle Beams on both ends**
- **Alternate side-by-side, forward then behind**
- **1 Row of 4 & 1 Row of 5**
- **Stack Saddle Beams so that they’re set alternating left then right**
## Bundling Standards: Common Accessories

<table>
<thead>
<tr>
<th>Name</th>
<th>Product Code</th>
<th>Weight (lbs)</th>
<th>Name</th>
<th>Product Code</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drophead</td>
<td>1204930</td>
<td>9.90</td>
<td>R12x10</td>
<td>6204516</td>
<td>0.79</td>
</tr>
<tr>
<td>Prop Positioner 38</td>
<td>6204958</td>
<td>0.22</td>
<td>Safety Catch</td>
<td>1204955</td>
<td>3.53</td>
</tr>
<tr>
<td>H20 Multi Clamp</td>
<td>6204539</td>
<td>0.77</td>
<td>Guardrail Post Adaptor</td>
<td>890.000016</td>
<td>3.25</td>
</tr>
<tr>
<td>Connecting Bracket HV</td>
<td>1204933</td>
<td>3.08</td>
<td>Coupling Set 225 (includes 2 Plates &amp; 6 bolts &amp; nuts)</td>
<td>1204521</td>
<td>35.20</td>
</tr>
<tr>
<td>R12x50</td>
<td>6204512</td>
<td>0.44</td>
<td>Lumber Bracing Clamp</td>
<td>14201420</td>
<td>2.42</td>
</tr>
<tr>
<td>Guardrail Post HV</td>
<td>1204960</td>
<td>18.30</td>
<td>Spanner for HV Prop</td>
<td>2204929</td>
<td>6.62</td>
</tr>
</tbody>
</table>
# Customer Return Checklist

**Customer:** Bond Concrete  
**Job #** BBOND-SO1  
**Residential Shoring**  
1234 Satsuma DR  
Houston, TX 77072

<table>
<thead>
<tr>
<th>P/C</th>
<th>Description</th>
<th>Unit</th>
<th>Weight Each</th>
<th>Returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3204218</td>
<td>AluBeam 225 L = 4.80m</td>
<td>EA</td>
<td>89.96</td>
<td></td>
</tr>
<tr>
<td>I3204218</td>
<td>AluBeam 225 L = 4.80m</td>
<td>EA</td>
<td>89.96</td>
<td></td>
</tr>
<tr>
<td>C201.200.0390</td>
<td>Girder H20 3.9m 12'9&quot;</td>
<td>EA</td>
<td>36.69</td>
<td></td>
</tr>
<tr>
<td>C201.200.0560</td>
<td>Girder H20 5.9m 19'4&quot;</td>
<td>EA</td>
<td>60.04</td>
<td></td>
</tr>
<tr>
<td>I201.200.0560</td>
<td>Girder H20 5.9m 19'4&quot;</td>
<td>EA</td>
<td>60.04</td>
<td></td>
</tr>
<tr>
<td>I2204277</td>
<td>HV Prop 1.75 - 3.05m</td>
<td>EA</td>
<td>33.96</td>
<td></td>
</tr>
<tr>
<td>C1204908</td>
<td>Main Beam HV L = 1.70m</td>
<td>EA</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>C1204909</td>
<td>Main Beam HV L = 3.50m</td>
<td>EA</td>
<td>62.48</td>
<td></td>
</tr>
<tr>
<td>C1204912</td>
<td>Main Beam HV L = 5.30m</td>
<td>EA</td>
<td>81</td>
<td></td>
</tr>
<tr>
<td>C1204915</td>
<td>Sec Beam HV L = 1.15m</td>
<td>EA</td>
<td>8.14</td>
<td></td>
</tr>
<tr>
<td>C1204921</td>
<td>Sec Beam HV L = 1.70m</td>
<td>EA</td>
<td>12.64</td>
<td></td>
</tr>
<tr>
<td>I1204904</td>
<td>Main Beam HV L = 1.15m</td>
<td>EA</td>
<td>18.74</td>
<td></td>
</tr>
<tr>
<td>C1204930</td>
<td>Drop head Galvanized</td>
<td>EA</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>C1204955</td>
<td>Safety Catch</td>
<td>EA</td>
<td>3.03</td>
<td></td>
</tr>
<tr>
<td>C3204958</td>
<td>Prop Positioner 38</td>
<td>EA</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>C90.000009</td>
<td>Bolt 1/2&quot; N.W.F. Drophead</td>
<td>EA</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>I1204900</td>
<td>Guardrail Post HV</td>
<td>EA</td>
<td>18.3</td>
<td></td>
</tr>
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<td>DB 300 Prop</td>
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<td>C41201206</td>
<td>PropDB C35D 1.95-3.50m G</td>
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</table>

**Total Sq Ft Out:** 0.00  
**Total Weight Out:** 84,748.62

---

**For Office Use Only**

Driver:  
Arrival Time:  
Departure Time: 

**Truck Type:**  
**Comments:**
11. Checklist for returning hired components

Make sure that...

☐ all dirt and concrete residue has been cleaned off the components.

☐ the components are sorted according to type.

☐ damaged and dirty components are kept separate.

☐ the components are grouped together or packaged as described in section 8.1.

☐ release agent has not been sprayed on the HV panels prior to their return.

☐ no more than 3 "Barelies" have been stacked on top of each other and no more than 2 placed next to each other on the HGV.

☐ no more than 2 mesh boxes have been stacked on top of each other and no more than 2 placed next to each other on the HGV.

☐ no more than 3 stacks of beams have been stacked on top of each other and no more than 2 placed next to each other on the HGV.

☐ no more than 2 racks of 30 panels have been placed next to each other on the HGV. DO NOT STACK ON TOP OF EACH OTHER!

☐ no more than 2 racks of 14 panels have been stacked on top of each other and no more than 2 placed next to each other on the HGV
<table>
<thead>
<tr>
<th>Outer Leg Dia.</th>
<th>3 in.</th>
<th>3 in.</th>
<th>3 in.</th>
<th>3 in.</th>
<th>3 in.</th>
<th>3 in.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6’5” - 11’6”</td>
<td>8’5” - 13’6”</td>
<td>10’5” - 15’6”</td>
<td>10’2” - 18”</td>
<td>12’2” - 20”</td>
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</tr>
<tr>
<td>Eur</td>
<td>DB 350</td>
<td>DB 350</td>
<td>DB 350</td>
<td>DB 350</td>
<td>DB 350</td>
<td>DB 350</td>
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<tr>
<td>Post Length</td>
<td>2 ft ext</td>
<td>2 ft ext</td>
<td>Top + bott</td>
<td>2 ft ext</td>
<td>2 ft ext</td>
<td>2 ft ext + Bottom</td>
</tr>
<tr>
<td>5’-03’</td>
<td>5 1/4 ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5’-07’</td>
<td>5 2/4 ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5’-11’</td>
<td>6 ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6’-03’</td>
<td>6 1/4 ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6’-07’</td>
<td>7 1/4 ft</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6’-11’</td>
<td>7 3/4 ft</td>
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</tr>
<tr>
<td>7’-03’</td>
<td>8 1/4 ft</td>
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<tr>
<td>7’-07’</td>
<td>8 3/4 ft</td>
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<td>9 2/4 ft</td>
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<td>8’-06’</td>
<td>9 3/4 ft</td>
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</tr>
<tr>
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<td>9 9/16” Lbs</td>
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<tr>
<td>9’-02’</td>
<td>9 9/16” Lbs</td>
<td></td>
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<tr>
<td>9’-06’</td>
<td>9 9/16” Lbs</td>
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<tr>
<td>9’-10’</td>
<td>9 9/16” Lbs</td>
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<td>10’-06’</td>
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<td>10 3/4 ft</td>
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<tr>
<td>11’-02’</td>
<td>10 3/4 ft</td>
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</tr>
<tr>
<td>11’-06’</td>
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<tr>
<td>11’-10’</td>
<td>11 1/4 ft</td>
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<tr>
<td>12’-02’</td>
<td>12 1/4 ft</td>
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</tr>
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<td>12’-06’</td>
<td>12 1/4 ft</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12’-10’</td>
<td>12 3/4 ft</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>13’-01’</td>
<td>13 ft</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13’-05’</td>
<td>13 1/4 ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13’-09’</td>
<td>13 1/4 ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14’-01’</td>
<td>14 1/2 ft</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>14’-05’</td>
<td>14 1/2 ft</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>14’-09’</td>
<td>14 1/2 ft</td>
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<td>16 ft</td>
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</tr>
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<td>16’-01’</td>
<td>16 ft</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>16’-05’</td>
<td>16 ft</td>
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</tr>
<tr>
<td>16’-09’</td>
<td>16 ft</td>
<td></td>
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</tr>
<tr>
<td>17’-01’</td>
<td>17 ft</td>
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</tr>
<tr>
<td>17’-05’</td>
<td>17 ft</td>
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<td></td>
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<tr>
<td>17’-09’</td>
<td>17 3/4 ft</td>
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<td></td>
</tr>
<tr>
<td>18’-01’</td>
<td>18 ft</td>
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<td></td>
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</tr>
<tr>
<td>18’-04’</td>
<td>18 1/4 ft</td>
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<td></td>
</tr>
<tr>
<td>18’-08’</td>
<td>18 1/4 ft</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>19’-00’</td>
<td>19 ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19’-04’</td>
<td>19 1/4 ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19’-08’</td>
<td>19 3/4 ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20’-00’</td>
<td>20 ft</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>20’-04’</td>
<td>20 1/4 ft</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>20’-08’</td>
<td>20 1/4 ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21’-00’</td>
<td>21 ft</td>
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</tr>
<tr>
<td>21’-04’</td>
<td>21 1/4 ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21’-08’</td>
<td>21 3/4 ft</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22’-00’</td>
<td>22 ft</td>
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### Properties

<table>
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<th>Properties (X-axis)</th>
<th>Main Beams</th>
<th>Secondary Beams</th>
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<tr>
<td></td>
<td>IMP</td>
<td>SI</td>
</tr>
<tr>
<td>I</td>
<td>13.4 in^2</td>
<td>559.3 cm^2</td>
</tr>
<tr>
<td>S</td>
<td>3.7 in^3</td>
<td>60.8 cm^3</td>
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<tr>
<td>E</td>
<td>10.1E6lb/in^2</td>
<td>7.02E6 N/cm^2</td>
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<tr>
<td>Mmax</td>
<td>71,472 in-lb</td>
<td>813,700 N-cm</td>
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<tr>
<td>Vmax</td>
<td>6,000 lb</td>
<td>26,900 N</td>
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#### Plywood Support Spacing

(\(\frac{3}{4}\)" STRUC-1 PLYWOOD)

<table>
<thead>
<tr>
<th>Secondary Beam Spacing</th>
<th>Max. Slab Thickness</th>
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<tr>
<td></td>
<td>Face Grain Parallel to Supports</td>
</tr>
<tr>
<td>12&quot; o.c.</td>
<td>&gt; 19 to 30(^b)</td>
</tr>
<tr>
<td>16&quot; o.c.</td>
<td>&gt; 13&quot; to 19(^a)</td>
</tr>
<tr>
<td>19.2&quot; o.c.</td>
<td>&gt; 8&quot; to 13(^a)</td>
</tr>
<tr>
<td>24&quot; o.c.</td>
<td>&gt; 0&quot; to 8(^a)</td>
</tr>
</tbody>
</table>

(a) Secondary beam spacing limited by plywood strength.

(b) Secondary beam spacing limited by beam strength.

#### Lumber Beam Span Chart

(USING SPF 4x4)

<table>
<thead>
<tr>
<th>Lumber Beam Spacing (in.)</th>
<th>Slab Thickness</th>
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<tr>
<td></td>
<td>8&quot;</td>
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<tr>
<td>12</td>
<td>75&quot;</td>
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<tr>
<td>16</td>
<td>70&quot;</td>
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<tr>
<td>19.2</td>
<td>67&quot;</td>
</tr>
<tr>
<td>24</td>
<td>62&quot;</td>
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</tbody>
</table>

Source: National Forest Products Association
## Properties

### 5'-7" Secondary Beam Spacing Chart
Lower of Plywood or Bending governing (ply 1/360 max)(sec bm 1/288 max)
Secondary Beam Loaded entire length (67")

<table>
<thead>
<tr>
<th>Slab Thk</th>
<th>Sec 3/4&quot;</th>
<th>Sec 3/4&quot;</th>
<th>Sec 5/8&quot;</th>
<th>Sec 5/8&quot;</th>
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### 3'-9" Secondary Beam Spacing Chart
Lower of Plywood or Bending governing (ply 1/360 max)(sec bm 1/288 max)
Secondary Beam Loaded entire length (45")

<table>
<thead>
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Rev 10/22/09
Recommended Frame Shoring Erection Procedure

INTRODUCTION
Guides to contractors, architects, engineers, dealers, etc., for the proper use of this equipment are deemed necessary, and for this reason the Scaffolding, Shoring & Forming Institute has prepared this bulletin. Consult Safe Practices for Erection and Dismantling of Frame Shoring, Single Post Shoring Safety Rules, Formwork Safety Rules, and Horizontal Shoring Beam Safety Rules prepared by the Institute.

NOMENCLATURE
1. Adjustment Screw - device composed of a threaded screw and an adjusting handle used for the vertical adjustment of the shoring and formwork.
2. Base Plate - a device used to distribute the load.
3. Coupling Plun - an insert device used to align lifters or tiers vertically.
4. Cross-bracing - system of members connecting frames to make a tower structure.
5. Extension Device - any device used to obtain vertical adjustment of shoring towers other than an adjustment screw.
6. Factor of Safety - the ratio of ultimate load to the allowable load.
7. Formwork - the material used to give the required shape and support of poured concrete, consisting primarily of:
   - Sheathing - material which is in direct contact with the concrete.
   - Joists - members which directly support sheathing.
   - Stringers or ledgers - members which directly support the joists.
8. Frame - the principal prefabricated structural unit in a tower.
9. Lifts or Tiers* - the number of frames stacked one above each other in a vertical direction.
10. Locking Device - a device used to secure the cross brace to the frame.
11. Safe Leg Load - that load which can safely be directly imposed on the frame leg.
12. Shoring Layout - an engineered drawing prepared prior to erection showing arrangement of equipment for proper shoring.
13. Sill or Mud Sill - a footing, usually wood, which distributes the vertical shoring loads to the ground or slab below.
15. Ultimate Load - the maximum load which may be placed on a structure causing failure by buckling of column members or failure of some other component.
* These terms can be used synonymously

INSPECTION OF SHORING EQUIPMENT
PRIOR TO ERECTION
The three main areas of inspection are for rust, straightness of members and welds. This applies to all components of a shoring system.
1. Rust - Rusted shoring equipment may indicate abuse, neglect, or corrosion and, if severe, should not be used.
2. Straightness of members - Mishandling, trucking and storing may cause damage to shoring equipment. All members or parts of all shoring components should be straight and free from bends, kinks or dents.
3. Welds - Equipment should be checked before use for damaged welds and any piece of equipment showing damaged welds or rewelding beyond the original factory weld should not be used. The factory weld reference pertains to location and quality of rewelds.
While rust, straightness and welds are of primary concern, other component parts should be checked.
4. Locking devices on frames and braces shall be in good working order, and if not, must be repaired or replaced prior to use.
5. Coupling pins must effectively align the frame legs.
6. Pivoted cross braces must have the center pivot securely in place.

SAFE BEARING LOADS FOR SOILS
Considering that the allowable loads (bearing) on various soils and rock range from less than 1000 p.s.f. (47.9 kN/m²) to more than 50,000 p.s.f. (2393.7 kN/m²) care should be exercised in determining the capacity of the soil for every shoring job, realizing that weather conditions can turn an otherwise suitable ground condition into a hazardous situation. As an example, dry clay with an allowable bearing capacity of 8,000 p.s.f. (383.0 kN/m²) could become very plastic after a rainfall and drop to less than 2,000 p.s.f. (95.8 kN/m²).
Care should also be taken not to excessively disturb the soil. If fill is required in shored areas, a qualified engineer should be consulted as to materials and compaction.
FOUNDATIONS
The purpose of good foundation or mud sill is to distribute the shoring load over a suitable ground area. The size of the footing or sill is determined by the total shoring load carried over a particular ground area, and by the nature of the soil supporting these sills.

The total shoring load should be computed and the sills designed accordingly.

Suitable sills should be used on a pan or grid dome, floor, or any other floor system involving voids, where a frame leg could concentrate an undesirable load on a thin concrete section.

When shoring from earth or fill, the area should be leveled and the sills spaced in a pattern assuring adequate stability for all shoring legs.

ERECTON OF FRAMES
The work of erecting the shoring should be under the supervision of a person with proper experience and aptitude for securing a safe installation.

Shoring layouts made by a qualified shoring designer must be strictly adhered to when locating frame legs. Layouts may be obtained from your shoring supplier in most instances.

Advance planning will help the erection of frames to progress smoothly. The material should be unloaded as close to the area to be shored as possible and should be arranged in the order it is to be used. Adjustment screws should be set to their approximate final adjustment before setting up the shoring units. At this time, a person should check to see that all frames which require coupling pins have them, and that all frames which require accessories at the top do not have coupling pins. Consult safety rules as recommended by the Institute.

To expedite erection of the shoring and to be sure the loading is distributed the way the shoring is designed, the location of each tower should be marked on the floor by use of chalk line or some other simple method. If required, sills should be placed first. After the location of the shoring towers has been marked, the adjustment screws or base plates, whichever is to be used, along with the necessary braces, should be distributed to each set of marks indicating the location of the tower.

After assembling the basic unit it should be leveled so that no matter how high the final tower is to be, the additional frames will be level and plumb as they are installed. When the basic unit is leveled, it is ready to receive the next tier of frames. For higher lifts, a work platform is easily formed for erecting the shoring by using planks on the top horizontal member of the frames. Tie towers of shoring frames together with sufficient bracing to make a rigid, solid unit.

FINAL INSPECTION OF ERECTED SHORING EQUIPMENT
The following is a list of check points to be covered when making a final inspection of shoring equipment prior to the placing of concrete on the form. All points should be carefully checked to insure a safe and accident-free job.

1. Check to see that there is a sound footing, or sill, under every leg of every frame on the job. Check also for possible washout due to rain.
2. Check to make certain that all base plates or adjustment screws are in firm contact with the footing or sill. All adjustment screws should be snug against the legs of the frame.
3. Obtain a copy of the shoring layout that was prepared for this specific job. Make sure that the spacings between towers and the cross brace spacing of the towers do not exceed the spacings shown on the layout. If any deviation is necessary because of field condition consult with the qualified shoring designer who prepared the layout for his approval of the actual field setup.
4. Frames should be checked for plumbness in both directions. The maximum allowable tolerance for a frame which is out of plumb is (1/8 inch in 3 feet). If the frames exceed this tolerance the base should be adjusted until the frames are within the tolerance.
5. If there is a gap between the lower end of one frame and the upper end of another frame, it indicates that one adjustment screw must be adjusted to bring the frames in contact. If this does not help, it indicates the frame is out of square and should be removed.
6. When two or more tiers of frames are used, each shall be braced to at least one adjacent frame.
7. While checking the cross braces also check the locking devices to assure that they are all in their closed position or that they are all tight.
8. Check the upper adjustment screw or shore head to assure that it is in full contact with the formwork. If it is not in contact, it should be adjusted or shimmed until it is.
9. Check to see that the obvious mistakes of omitting joists, using the wrong size ledger or incorrectly orienting members have not been made. Check the print to see that the lumber used is equal to that specified on the shoring layout. Check the general formwork scheme to make sure that it follows good standard practice for formwork.
10. If the shoring layout shows exterior bracing for lateral stability, check to see that this bracing is in place in the locations specified on the drawing. Check to make sure that the devices which attach this bracing to the equipment are securely fastened to the legs of the shoring equipment. If tubing clamps are used, make sure that they have been properly tightened. If devices for holding timber require nails, check to see that sufficient nails have been used to hold the bracing securely to the frame legs.

DISMANTLING OF SHORING EQUIPMENT
Premature releasing or stripping of shoring can be a cause of failure. A qualified engineer must decide when and how stripping is to proceed. Variables which enter into this phase include load transfer, weather conditions, variations in different parts of the structure and the setting qualities of the concrete.

After approval of a qualified engineer is obtained, follow approved dismantling procedure. Screw jacks should be released only far enough to remove forming member. The dismantling of the equipment can then be performed in the reverse method used in erection and moved to the next location for reuse. It is often more desirable to merely release the adjusting screws to such a point that the forming members can be pulled away from the underside of the concrete and allowed to rest in certain modules on top of the frame shoring equipment and the entire unit moved to the next location. Formwork and shoring of varying sizes are frequently moved from one pour to other pours without dismantling or removing formwork.

Lower shoring components in a safe manner. Do not drop or throw components as this could result in injury to personnel or damage to equipment.

THE RESHORING OPERATION
Reshoring is one of the most critical operations in formwork; consequently, reshoring procedure must be designed by a qualified person and approved by the architect/engineer of record.

Extreme care must be taken to release the adjustment screws to a point where the slab takes its actual permanent deflection. The adjustment screws should then be tightened until contact is again made with the underside of the slab. In this manner, the frame reshoring below will not be carrying the load of the slab that it had previously shored.

Reshoring is usually done to facilitate maximum reuse of framework and may utilize the strength of the completed construction below when such construction is fully cured and capable of supporting the loads to be imposed by the additional construction above.

While reshoring is being placed, no construction loads should be permitted on the new construction.

Extra care should be taken during a reshoring operation where an upper slab being poured is heavier than the slab being reshored.
INDEPENDENT POST SHORE SYSTEM SAFETY RULES
As Recommended by
SCAFFOLDING, SHORING AND FORMING INSTITUTE

It shall be the responsibility of all employers and users to read and comply with the following common sense guidelines, which are designed to promote safety in the erection, dismantling, and use of independent post shore systems. These guidelines are not all-inclusive nor do they supplant or replace other additional safety and precautionary measures to cover usual or unusual conditions. If these guidelines conflict in any way with any state, provincial, local or federal statute or governmental regulation, said statute or regulation shall supersede these guidelines and it shall be the responsibility of each employee and user to comply therewith and also to be knowledgeable and understand all state, local or federal statutes or governmental regulations pertaining to independent post shore systems.

A. GENERAL GUIDELINES
1. POST THESE SHORING SAFETY GUIDELINES in a conspicuous place and be sure that all persons who erect, dismantle or use shoring are aware of them.
2. FOLLOW ALL STATE, PROVINCIAL, LOCAL AND FEDERAL CODES, ORDINANCES AND REGULATIONS pertaining to shoring.
3. SURVEY AT JOB SITE. A survey by a qualified person shall be made of the job site for hazards, such as unprepared earth fills, ditches, debris, high tension wires, unguarded openings and other hazardous conditions. These conditions should be corrected or avoided as noted in the following sections.
4. PLAN SHORING ERECTION SEQUENCE in advance and obtain necessary access equipment to accomplish the work safely.
5. INSPECT ALL EQUIPMENT BEFORE USING. Never use any equipment that is structurally defective in any way. Mark it or tag it as defective, then remove it from the job site.
6. A SHORING LAYOUT prepared by a person qualified to analyze the intended loading consistent with the manufacturer’s recommended safe working loads, shall be used on the job at all times.
7. ERECT, DISMANTLE OR ALTER SHORING only under the supervision of a competent person.
8. DO NOT ABUSE OR MISUSE THE SHORING EQUIPMENT. Do not modify equipment.
9. INSPECT ERECTED SHORING: (a) immediately prior to concrete placement; (b) during concrete placement and while vibrating concrete; and (c) after concrete placement until concrete is set.
10. NEVER TAKE CHANCES! IF IN DOUBT REGARDING THE SAFETY OR USE OF THE SHORING, CONSULT YOUR SHORING SUPPLIER.
11. USE SHORING EQUIPMENT only for the purpose or in ways for which it was intended. Use proper tools when installing equipment.
12. ERECTING AND DISMANTLING OF SHORING requires good physical condition. Do not work on shoring if you feel dizzy, unsteady in any way or are impaired in any way by drugs or any other substances.
13. DO NOT USE INDEPENDENT POST SHORE SYSTEMS for fall arrest anchorage.

B. ALL INDEPENDENT POST SHORE SYSTEM DECKS SHALL BE LATERALLY STABILIZED by the existing building structure and/or additional bracing as specified by the supplier/manufacturer.

C. USE SUPPLIER/MANUFACTURER’S RECOMMENDED SAFE WORKING LOADS consistent with the deck panel configurations and height of posts used.

D. FOLLOW SUPPLIER/MANUFACTURER’S RECOMMENDED DIRECTION for:
   a) Location and selection of deck panel type and stringers.
   b) Type and height of vertical shoring components.
   c) Starting points of deck layouts.

E. DO NOT MAKE UNAUTHORIZED CHANGES TO THE LAYOUT. Always consult the designer prior to making changes.

F. PRIOR TO WORKING ON DECKS
   a) All posts shall be plumb and adjusted evenly to ensure proper bearing contact.
   b) Deck shall be laterally stabilized and proper means of fall protection installed.

G. FALL PROTECTION SHALL BE PROVIDED ON ALL OPEN SIDES AND OPENINGS in formwork and slabs as required by applicable code.

H. SAFE ACCESS SHALL BE PROVIDED TO ALL FORMWORK as required by applicable code.

I. IF MOTORIZED CONCRETE PLACEMENT EQUIPMENT IS TO BE USED, ensure that lateral loads, vibration and other forces have been considered and adequate precautions taken to assure stability.

J. PLAN DECK PANEL LAYOUT TO ENSURE AGAINST INSTABILITY AND UNSUPPORTED CANTILEVERS. Take all necessary precautions to avoid uplift of cantilevered panels during and after construction. Make certain that form panels intended to be cantilevered are tied down to prevent tipping.

K. PANELS EXPOSED TO UPLIFTING WIND FORCES SHALL BE LOCKED OR TIED DOWN TO PREVENT PANEL UPLIFT.

L. PLAN CONCRETE PLACEMENT METHODS AND SEQUENCES TO ENSURE BALANCED LOADING of shoring equipment and panels, including cantilevered panels.

M. BRACING SHALL BE FASTENED SECURELY. Check to see that clamps, screws, pins and all other components are in a closed or engaged position.

N. FOLLOW SPECIAL PRECAUTIONS RECOMMENDED BY THE SUPPLIER/MANUFACTURER WHEN SHORING FROM OR TO SLOPED SURFACES.

O. PROVIDE AND MAINTAIN A SOLID FOOTING to distribute maximum loads properly.

P. WINDLOAD: Erector must analyze the forming/shoring system for additional loads imposed from wind loading and provide adequate anchorage to resist these forces, including uplifting wind forces.

Q. RESHORING is one of the most critical operations in formwork; consequently, the reshoring procedure shall be designed by a qualified person and should be approved by the architect/engineer of record.
HORIZONTAL SHORING BEAM SAFETY RULES
As Recommended by
SCAFFOLDING, SHORING AND FORMING INSTITUTE, INC.

It shall be the responsibility of all employers and users to read and comply with the following common sense guidelines which are designed to promote safety in the erection, dismantling and use of horizontal shoring beams. These guidelines are not all inclusive nor do they supplant or replace other additional safety and precautionary measures to cover usual or unusual conditions. If these guidelines conflict in any way with any state, provincial, local or federal statute or governmental regulation, said statute or regulation shall supersede these guidelines and it shall be the responsibility of each employee and user to comply therewith and also to be knowledgeable and understand all state, local or federal statutes or governmental regulations pertaining to horizontal shoring beams.

A. GENERAL GUIDELINES
1. POST THESE SHORING SAFETY GUIDELINES in a conspicuous place and be sure that all persons who erect, dismantle or use shoring are aware of them.
2. FOLLOW ALL STATE, PROVINCIAL, LOCAL AND FEDERAL CODES, ORDINANCES AND REGULATIONS pertaining to shoring.
3. SURVEY THE JOB SITE. A survey by a qualified person shall be made of the job site for hazards, such as untamped earth fills, ditches, debris, high tension wires, unguarded openings and other hazardous conditions. These conditions should be corrected or avoided as noted in the following sections.
4. PLAN SHORING ERECTION SEQUENCE in advance and obtain necessary access equipment to accomplish the work safely.
5. INSPECT ALL EQUIPMENT BEFORE USING. Never use any equipment that is structurally defective in any way. Mark it or tag it as defective, then remove it from the jobsite.
6. A SHORING DRAWING prepared by a person qualified to analyze the loading intended and consistent with the manufacturer’s recommended safe working loads, shall be used on the job at all times.
7. ERECT, Dismantle OR ALTER SHORING only under the supervision of a qualified person.
8. DO NOT ABUSE OR MISUSE THE SHORING EQUIPMENT.
9. INSPECT ERECTED SHORING: (a) immediately prior to concrete placement; (b) during concrete placement and while vibrating concrete, and (c) after concrete placement until concrete is set.
10. NEVER TAKE CHANCES! IF IN DOUBT REGARDING THE SAFETY OR USE OF THE SHORING, CONSULT YOUR SHORING SUPPLIER.
11. USE SHORING EQUIPMENT only for the purposes or in ways for which it was intended. Use proper tools when installing equipment.
12. ERECTING AND Dismantling OF SHORING requires good physical condition. Do not work on shoring if you feel dizzy, unsteady in any way or are impaired in any way by drugs or any other substances.
13. DO NOT USE SHORING SYSTEMS for fall protection.

B. USE MANUFACTURER’S RECOMMENDED SAFE WORKING LOADS AND PROCEDURES FOR:
1. Span, spacing, and types of shoring beams.
2. Types, sizes, heights, and spacing of vertical shoring supports.

C. USE LUMBER EQUIVALENT TO THE STRESS, species, grade and size used on the layout. Use only lumber that is in good condition. Do not splice between supports.

D. DO NOT MAKE UNAUTHORIZED CHANGES OR SUBSTITUTION OF EQUIPMENT; always consult your supplier prior to making changes necessitated by jobsite conditions.

E. PROVIDE AND MAINTAIN ADEQUATE SUPPORT TO properly distribute shoring loads. When supporting horizontal shoring beams on:
1. Masonry walls, insure that masonry units have adequate strength. Brace walls as necessary.
2. Ledgers supported by walls using bolts, or other means, they should be properly designed and installed per recommendation of supplier or job architect/engineer.
3. Formwork, such formwork should be designed for additional loads imposed by the shoring beams.
4. Structural Steel Framework, the ability of the steel to support this construction loading should be checked and approved by the responsible project architect/engineer.

5. When supporting horizontal beams on steel hangers, be sure that the bearing ends fully engage on the hangers. The hangers shall be designed to conform to the bearing end and shall have a rated strength to safely support the shoring loads imposed. (Follow hanger manufacturers’ recommendations.)

6. Do not bear adjustable horizontal beams on other adjustable horizontal beams.

F. SPECIAL CONSIDERATION MUST BE GIVEN TO THE INSTALLATION OF HORIZONTAL SHORING:

1. When sloped or supported by sloping ledgers (stringers).
2. When ledger (stringer), including blocking, height/width ratio exceeds 2 ½ to 1. Under no circumstances shall horizontal shoring beams bear on a single “two by” ledger (stringer).
3. When eccentric loading conditions exist.
4. When ledger (stringer) consists of multiple members. (i.e., double 2x6, 2x8, etc.)

G. ASSURE THAT BEARING ENDS OF SHORING BEAMS ARE PROPERLY SUPPORTED and that locking devices are properly engaged before placing any load on beams.

H. IF MOTORIZED CONCRETE PLACEMENT EQUIPMENT IS TO BE USED, be sure that lateral and other forces have been considered and adequate precautions taken to assure stability.

I. HORIZONTAL SHORING BEAMS SHOULD NOT be supported other than at the bearing prongs unless recommended by supplier.

J. DO NOT NAIL BEAM BEARING PRONGS TO LEDGER.

K. PLAN CONCRETE POURING METHODS AND SEQUENCES TO insure against unbalanced loading of the shoring equipment. Take all necessary precautions to avoid uplift of shoring components and formwork.

L. AVOID SHOCK OR IMPACT LOADS FOR which the shoring was not designed.

M. DO NOT PLACE ADDITIONAL, TEMPORARY LOADS (such as rebar bundles) on erected formwork or poured slabs, without checking the capacity of the shoring and/or structure to safely support such additional loads.

N. DO NOT RELEASE ANY PART OF THE FORMWORK OR SHORING until proper authority has been obtained. Particular consideration must be given to reshoring procedures.

O. WINDLOAD: Erector must analyze the forming/shoring system for additional loads imposed from wind loading and provide adequate anchorage to resist these forces, including uplifting wind forces.

P. RESHORING is one of the most critical operation in formwork; consequently, reshoring procedure must be designed by a qualified person and approved by the architect/engineer of record.
SINGLE POST SHORE SAFETY RULES
As Recommended by
SCAFFOLDING, SHORING AND FORMING INSTITUTE

It shall be the responsibility of all employers and users to read and comply with the following common sense guidelines which are designed to promote safety in the erection, dismantling and use of single post shoring. These guidelines are not all inclusive nor do they supplant or replace other additional safety and precautionary measures to cover usual or unusual conditions. If these guidelines conflict in any way with any state, provincial, local or federal statute or governmental regulation, said statute or regulation shall supercede these guidelines and it shall be the responsibility of each employee and user to comply therewith and also to be knowledgeable and understand all state, local or federal statutes or governmental regulations pertaining to single post shoring.

A. GENERAL GUIDELINES
1. POST THESE SHORING SAFETY GUIDELINES in a conspicuous place and be sure that all persons who erect, dismantle or use shoring are aware of them.
2. FOLLOW ALL STATE, PROVINCIAL, LOCAL AND FEDERAL CODES, ORDINANCES AND REGULATIONS pertaining to shoring.
3. SURVEY THE JOB SITE. A survey by a qualified person shall be made of the job site for hazards, such as untamped earth fills, ditches, debris, high tension wires, unguarded openings and other hazardous conditions. These conditions should be corrected or avoided as noted in the following sections.
4. PLAN SHORING ERECTION SEQUENCE in advance and obtain necessary access equipment to accomplish the work safely.
5. INSPECT ALL EQUIPMENT BEFORE USING. Never use any equipment that is structurally defective in any way. Mark it or tag it as defective, then remove it from the jobsite.
6. A SHORING DRAWING prepared by a person qualified to analyze the loading intended and consistent with the manufacturer’s recommended safe working loads, shall be used on the job at all times.
7. ERECT, DISMANTLE OR ALTER SHORING only under the supervision of a qualified person.
8. DO NOT ABUSE OR MISUSE THE SHORING EQUIPMENT.
9. INSPECT ERECTED SHORING: (a) immediately prior to concrete placement; (b) during concrete placement and while vibrating concrete, and (c) after concrete placement until concrete is set.
10. NEVER TAKE CHANCES! IF IN DOUBT REGARDING THE SAFETY OR USE OF THE SHORING, CONSULT YOUR SHORING SUPPLIER.
11. USE SHORING EQUIPMENT only for the purposes or in ways for which it was intended. Use proper tools when installing equipment.
12. ERECTING AND DISMANTLING OF SHORING requires good physical condition. Do not work on shoring if you feel dizzy, unsteady in any way or are impaired in any way by drugs or any other substances.
13. DO NOT USE SHORING SYSTEMS for fall protection.

B. USE MANUFACTURER’S RECOMMENDED SAFE WORKING LOADS CONSISTENT with the height from supporting sill to formwork.

C. PROVIDE AND MAINTAIN A SOLID FOOTING to distribute maximum loads properly.

D. PLUMB ALL POST SHORES AS THE ERECTION PROCEEDS. Check plumb of post shores JUST PRIOR TO POUR.

E. CHECK TO SEE THAT ALL CLAMPS, SCREWS, PINS and all other components are in a CLOSED OR ENGAGED POSITION.

F. MAKE CERTAIN THAT ALL BASE PLATES AND SHORE HEADS ARE IN FIRM CONTACT with THE FOOTING SILL AND FORM MATERIAL.

G. IF MOTORIZED CONCRETE EQUIPMENT IS TO BE USED, be sure that post shores are SPACED AND BRACED WITH THIS FACT IN MIND.

H. FOR STABILITY, SINGLE POST SHORES SHALL HAVE ADEQUATE BRACING provided in the longitudinal, transverse and diagonal directions. Bracing shall be installed as the shores are being erected.
I. **DEVICES WHICH ATTACH THE STABILITY BRACING** shall be securely fastened to the single post shores.

J. **DO NOT USE SINGLE POST SHORES MORE THAN ONE TIER HIGH.** Where greater shore heights are required consult the supplier.

K. **ADJUSTMENT OF SINGLE POST SHORES TO RAISE FORMWORK** shall not be made after concrete is in place.

L. **AVOID ECCENTRIC LOADS ON U-HEADS, AND TOP PLATES** by centering stringers on those members.

M. **USE SPECIAL PRECAUTIONS** when shoring from or to sloped surfaces.

N. **WINDLOAD:** Erector must analyze the forming/shoring system for additional loads imposed from wind loading and provide adequate anchorage to resist these forces, including uplifting wind forces.

N. **RESHORING** is one of the most critical operations in formwork; consequently, reshoring procedure must be designed by a qualified person and approved by the architect/engineer of record.

O. **DO NOT BACK-OFF OR STRIP POST SHORES** until proper authority is given.

P. **USE LUMBER STRESSES** consistent with age, type and condition of available lumber to be used. Use only lumber that is in good condition.

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SAFE PRACTICES FOR
ERECTING & DISMANTLING OF FRAME SHORING
As Recommended by
SCAFFOLDING, SHORING AND FORMING INSTITUTE, INC.
AND
SCAFFOLD INDUSTRY ASSOCIATION

It shall be the responsibility of all employers and users to read and comply with the following common sense guidelines which are designed to promote safety in the erection, dismantling and use of frame shoring. These guidelines are not all inclusive nor do they supplant or replace other additional safety and precautionary measures to cover usual or unusual conditions. If these guidelines conflict in any way with any state, provincial, local or federal statute or governmental regulation, said statute or regulation shall supersede these guidelines and it shall be the responsibility of each employee and user to comply therewith and also to be knowledgeable and understand all state, local or federal statutes or governmental regulations pertaining to frame shoring.

I. GENERAL GUIDELINES
   A. POST THESE SHORING SAFETY GUIDELINES in a conspicuous place and be sure that all persons who erect, dismantle or use shoring are aware of them.
   B. FOLLOW ALL STATE, PROVINCIAL, LOCAL AND FEDERAL CODES, ORDINANCES AND REGULATIONS pertaining to shoring.
   C. SURVEY THE JOB SITE. A survey by a qualified person shall be made of the job site for hazards, such as untamped earth fills, ditches, debris, high tension wires, unguarded openings and other hazardous conditions. These conditions should be corrected or avoided as noted in the following sections.
   D. PLAN SHORING ERECTION SEQUENCE in advance and obtain necessary access equipment to accomplish the work safely.
   E. INSPECT ALL EQUIPMENT BEFORE USING. Never use any equipment that is structurally defective in any way. Mark it or tag it as defective, then remove it from the jobsite.
   F. A SHORING DRAWING prepared by a person qualified to analyze the loading intended and consistent with the manufacturer’s recommended safe working loads, shall be used on the job at all times.
   G. ERECT, DISMANTLE OR ALTER SHORING only under the supervision of a qualified person.
   H. DO NOT ABUSE OR MISUSE THE SHORING EQUIPMENT.
   I. INSPECT ERECTED SHORING: (a) immediately prior to concrete placement; (b) during concrete placement and while vibrating concrete, and (c) after concrete placement until concrete is set.
   J. NEVER TAKE CHANCES! IF IN DOUBT REGARDING THE SAFETY OR USE OF THE SHORING, CONSULT YOUR SHORING SUPPLIER.
   K. USE SHORING EQUIPMENT only for the purposes or in ways for which it was intended. Use proper tools when installing equipment.
   L. ERECTING AND DISMANTLING OF SHORING requires good physical condition. Do not work on shoring if you feel dizzy, unsteady in any way or are impaired in any way by drugs or any other substances.
   M. DO NOT USE SHORING SYSTEMS for fall protection.

II. GUIDELINES FOR ERECTION AND USE OF SHORING
   A. PROVIDE AND MAINTAIN A SOLID FOOTING. The sills or cribbing for shoring shall be sound, rigid and capable of carrying the maximum design load without settling or moving.
   B. ALWAYS USE BASE PLATES. When sills or cribbing are used, base plates must be centered on them.
   C. ADJUSTING SCREWS SHALL BE USED to adjust to uneven grade conditions. Maintain all screw adjustments within the recommended height for the design load.
   D. PLUMB AND LEVEL ALL SHORING FRAMES as the erection proceeds. DO NOT force braces on frames - level the shoring towers until proper fit can be made. Maintain all shoring towers plumb and level.
   E. MAINTAIN THE SHORE FRAME SPACINGS OR TOWER HEIGHTS as shown on the shoring drawing. Where job site conditions require deviations from the shoring drawing, consult a qualified person.
   F. IF MOTORIZED CONCRETE EQUIPMENT is to be used, be sure that the shoring layout has been designed for use with this equipment and such fact is noted on the layout.
   G. USE CAUTION WHEN ERECTING FREE-STANDING TOWERS. Prevent tipping by guying or bracing when height exceeds 4 times the minimum base dimension.
   H. GIVE SPECIAL CONSIDERATION TO TEMPORARY LOADING. Areas where re-bar, material or equipment is to be stored temporarily may need to be strengthened to meet those loads.
I. DO NOT CLIMB CROSS BRACES. Use proper access equipment.
J. USE SPECIAL PRECAUTIONS when shoring from or to sloped surfaces.
K. USE ADJUSTMENT DEVICE ON TOP OF LEG to position the falsework - not the bottom adjusting screw.
L. SHORING LOADS ARE INTENDED TO BE CARRIED BY VERTICAL LEGS. Horizontal loading may require special consideration. Consult your shoring supplier for allowable loads on horizontal members.
M. AVOID ECCENTRIC LOADS on U-Heads, top plates and similar members by centering stringer loads on those members.

III. GUIDELINES FOR DISMANTLING SHORING
A. DO NOT REMOVE BRACES OR BACK OFF ON ADJUSTMENT SCREWS until proper authority is given.
B. DISMANTLED EQUIPMENT should be stockpiled in a planned manner and distributed to avoid concentrated loads on the partially cured concrete.
C. USE PROPER ACCESS EQUIPMENT in the dismantling process.
D. LOWER SHORING COMPONENTS in a safe manner. Do not drop or throw components as this could result in injury to personnel or damage to equipment.

IV. RESHORING – Reshoring is one of the most critical operations in formwork; consequently, reshoring procedure must be designed by a qualified person and approved by the architect/engineer of record.

V. WINDLOAD – Erector must analyze the forming/shoring system for additional loads imposed from wind loading and provide adequate anchorage to resist these forces, including uplifting wind forces.

These safety guidelines set forth some common sense procedures for safely erecting, dismantling and using frame shoring equipment. Since equipment and shoring systems differ, reference must always be made to the instructions and procedures of the supplier and/or manufacturer of the equipment. Since field conditions vary, and are beyond the control of the Scaffolding, Shoring & Forming Institute and the Scaffold Industry Association, safe and proper use of equipment is the sole responsibility of the employer and user.
FLYING DECK FORM SAFETY RULES
As Recommended by
THE SCAFFOLDING, SHORING AND FORMING INSTITUTE

It shall be the responsibility of all employers and users to read and comply with the following common sense guidelines which are designed to promote safety in the erection, dismantling and use of flying deck forms. These guidelines are not all inclusive nor do they supplant or replace other additional safety and precautionary measures to cover usual or unusual conditions. If these guidelines conflict in any way with any state, provincial, local or federal statute or governmental regulation, said statute or regulation shall supersede these guidelines and it shall be the responsibility of each employee and user to comply therewith and also to be knowledgeable and understand all state, local or federal statutes or governmental regulations pertaining to flying deck forms.

A. GENERAL GUIDELINES
1. POST THESE SHORING SAFETY GUIDELINES in a conspicuous place and be sure that all persons who erect, dismantle or use shoring are aware of them.
2. FOLLOW ALL STATE, PROVINCIAL, LOCAL AND FEDERAL CODES, ORDINANCES AND REGULATIONS pertaining to shoring.
3. SURVEY THE JOB SITE. A survey by a qualified person shall be made of the job site for hazards, such as untamed earth fills, ditches, debris, high tension wires, unguarded openings and other hazardous conditions. These conditions should be corrected or avoided as noted in the following sections.
4. PLAN SHORING ERECTION SEQUENCE in advance and obtain necessary access equipment to accomplish the work safely.
5. INSPECT ALL EQUIPMENT BEFORE USING. Never use any equipment that is structurally defective in any way. Mark it or tag it as defective, then remove it from the jobsite.
6. A SHORING DRAWING prepared by a person qualified to analyze the loading intended and consistent with the manufacturer’s recommended safe working loads, shall be used on the job at all times.
7. ERECT, DISMANTLE OR ALTER SHORING only under the supervision of a qualified person.
8. DO NOT ABUSE OR MISUSE THE SHORING EQUIPMENT.
9. INSPECT ERECTED SHORING: (a) immediately prior to concrete placement; (b) during concrete placement and while vibrating concrete, and (c) after concrete placement until concrete is set.
10. NEVER TAKE CHANCES! IF IN DOUBT REGARDING THE SAFETY OR USE OF THE SHORING, CONSULT YOUR SHORING SUPPLIER.
11. USE SHORING EQUIPMENT only for the purposes or in ways for which it was intended. Use proper tools when installing equipment.
12. ERECTING AND DISMANTLING OF SHORING requires good physical condition. Do not work on shoring if you feel dizzy, unsteady in any way or are impaired in any way by drugs or any other substances.
13. DO NOT USE SHORING SYSTEMS for fall protection.

B. DO NOT EXCEED manufacturer’s recommended safe working load.

C. ALL FLYING DECK FORMS SHALL BE assembled, moved and maintained in accordance with the supplier’s recommended procedures.

D. IF MOTORIZED CONCRETE EQUIPMENT is to be used, be sure that the shoring layout has been designed for use with this equipment and such fact is noted on the layout.

E. METHOD OF ADJUSTMENT should be provided on all flying deck form supporting members, for form leveling, vertical positioning, ease of stripping, and to adjust to uneven grade conditions where applicable.

F. MAKE CERTAIN THAT ALL SUPPORTING MEMBERS are in firm contact with the flying form stringer/ledger, and that supports are located in positions as shown on the shoring layout.

G. USE SPECIAL PRECAUTIONS when shoring from or to sloped surfaces.

H. RESHORING is one of the most critical operation in formwork; consequently, reshoring procedure must be designed by a qualified person and approved by the architect/engineer record.

I. USE DECK FORM MATERIALS WITH PROPERTIES as stated on the shoring layout drawing. Do not splice joists or ledgers between supports unless details are given on the shoring layout.
J. **DO NOT RELEASE FORMS** until proper authority is given.

K. **FIELD OPERATIONS SHALL BE**, at all times, under the direct supervision of a supervisor who is qualified and familiar with the procedures for assembly, erection, flying, and horizontal movement of the flying deck form system being used.

L. **MAKE CERTAIN** that a positively controlled method of tieback or braking is used when moving the deck form. The system must never be allowed to have free or uncontrolled horizontal movement.

M. **LEDGERS/STRINGERS AND JOISTS MUST BE** stabilized and laterally braced to assure that the deck form system is stable against any foreseeable lateral loads.

N. **THE CRANE USED TO FLY** the deck form must not pull the deck form out of the building bay. A controlled and independent device or force must provide for horizontal movement of the deck form.

O. **SLINGS AND RIGGING** used in flying the deck form system must comply with all safe practices and applicable governmental regulations governing their use.

P. **AVOID SHOCK OR IMPACT LOADS.**

Q. **DO NOT MAKE UNAUTHORIZED CHANGES OR** substitutions of equipment; always consult your supplier prior to making changes necessitated by jobsite conditions.

R. **SAFETY MEASURES** shall be taken for all personnel involved in the rigging of the flying deck form for flying. No personnel shall be allowed to “ride” the deck form or rigging during flying.

S. **DURING CONCRETE PLACEMENT AND DECK FORM RIGGING, THE FREE END CANTILEVER OF A DECK FORM** shall not exceed the amount as recommended by the supplier. Follow the recommended flying procedure as given by the supplier.

T. **ANY AND ALL LOOSE COMPONENTS OF THE** deck form system (i.e., bulkheads, beam sides, filler strips, etc.), if flown with the form, must be securely fastened to the deck form prior to moving.

U. **CONSULT YOUR SUPPLIER IF** weatherproof covering, etc., is to be attached to the flying system.

V. **ALL PERSONNEL IN THE AREA** shall be advised and protected during all flying operations. Do not stand under the deck form during the flying operation.

W. **ALL ATTACHED PERIMETER GUARDRAILS, MIDRAILS AND TOEBOARDS** shall conform to applicable codes and regulations.

X. **THE WEIGHT OF THE FLYING DECK FORM SHALL NOT** exceed the capacity of the crane for each application.

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