FOOTING & DECK FRAMING HOT TUB/BENCH DECK

Scale: 3/8" = 1'

HOT TUB AREA APROX.
WEIGHT FULL OF WATER
1500lbs. 35 lbs./SQ.FT
NOTE:
SEATS AND SIDING REMOVED
TO SHOW BENCH AND HOT
TUB FRAMING

TYP. BENCH FRAMING SECTION
Scale: 1-1/2" = 1'

BENCH FRAMING DECK
Scale: 3/8" = 1'
1. Outdoor environments are generally more corrosive to steel. If you choose to use ZMAX or HDG finish or stainless steel material on an outdoor project, you should periodically inspect your connectors and fasteners or have a professional inspection performed. Regular maintenance, including water-proofing of the wood used in your outdoor project is also a good practice.

2. Coatings Available:
   2.1. ZMAX: Galvanized (G185) 1.85 oz. of zinc per square foot of surface area. (Hot-dip galvanized per ASTM A653 total both sides). These products require hot-dip galvanized fasteners (fasteners which meet the specifications of ASTM A153).
   2.2. HDG - Hot Dip Galvanized: Products are hot-dip galvanized after fabrication (14 ga. and thicker). The coating weight increases with material thickness. The minimum specified coating weight is 2.0 oz. per square foot. (Per ASTM A123 total both sides). These products require hot-dip galvanized fasteners (fasteners which meet the specifications of ASTM A153).
   2.3. SS - Stainless Steel: Connectors are manufactured from Type 316L stainless steel, and provide greater durability against corrosion. Stainless-steel nails are required with stainless-steel products, and are available from Simpson Strong-Tie.

3. When using stainless steel fasteners, use stainless steel fasteners. When applications allow the use of ZMAX/HDG galvanized connectors, use HDG fasteners that meet the specifications of ASTM A153 or equivalent coating offered on Simpson Strong-Tie fasteners.

4. Due to many variables involved with outdoor construction, Simpson Strong-Tie cannot provide estimates on service life of connectors, anchors or fasteners.

5. To obtain optimal performance from Simpson Strong-Tie products, the products must be installed properly and used in accordance with the installation instructions and design limits provided by Simpson Strong-Tie.

6. All installation notes and guidelines within the construction connection blog shall apply for the connectors, anchors, and fasteners shown.

7. Simpson Strong-Tie reserves the right to change the specifications, design and models shown without notice or liability for such changes.

8. Simpson Strong-Tie does not guarantee the performance or safety of products that are modified, improperly installed or used in accordance with the design.

9. All references to bolts or machine bolts (MB) are structural quality through bolts (not lag screws or carriage bolts) equal to or better than ASTM A574, grade A. Bolt holes shall be at least a minimum 1/32" and no more than a maximum of 1/16" larger than the bolt diameter per 2005 NDS Section 11.1.2.

10. Unless noted otherwise, all references to standard cut washers refer to Type A plain washers (W) conforming to the dimensions shown in ASTM B18.22.1 for the appropriate rod size.

11. Unless stated otherwise, Simpson Strong-Tie cannot and does not make any representation regarding the suitability of use or load-carrying capacities of connectors installed with improper fasteners.

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**D01 General Notes**

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**D02 Fasteners**
**Model No.**

<table>
<thead>
<tr>
<th>Dimensions (in.)</th>
<th>Fasteners</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LSU210Z</strong></td>
<td>W H A</td>
</tr>
<tr>
<td>1 3/16 4 7/16 1 1/2</td>
<td>6-10d 5-10d 1/2</td>
</tr>
<tr>
<td><strong>LSSU210Z</strong></td>
<td>W H A</td>
</tr>
<tr>
<td>1 3/16 8 1/2 5 1/8</td>
<td>10 1/16 7 10d 1/2</td>
</tr>
</tbody>
</table>

1. For skewed LSU, the inner most face fasteners on the acute angle sides are not installed.
2. Refer to current Wood Construction Connectors catalog for additional information.

**ABAMZ**

**ABU4MZ**

**Typical ABA Installation (ABU Similar)**

**Typical PBS**

**Installation:**
- ABA, ABU - for pre-cast installed anchors. For Simpson Strong-Tie verified or mechanical anchors, omit and install in accordance with www.strongtite.com.
- Products require washers between the nut and the base. Washers are supplied with the ABU but not the ABA, which requires a standard cut washer.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Post</th>
<th>Dimensions (in.)</th>
<th>Anchor Dia.</th>
<th>Nails</th>
<th>SD Screws</th>
<th>Machine Bolts</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABAMZ</td>
<td>4d</td>
<td>3 3/16 3 1/8 3 3/16</td>
<td>- - 1/2</td>
<td>6-10d</td>
<td>8-SD 10d 1/2</td>
<td>- -</td>
</tr>
<tr>
<td>ABU4MZ</td>
<td>4d</td>
<td>3 3/16 3 5 1/4 1 3/8</td>
<td>2 3/8</td>
<td>12-16d</td>
<td>12-SD 10d 1/2</td>
<td>2 1/2</td>
</tr>
<tr>
<td>ABAMZ</td>
<td>4d</td>
<td>3 3/16 3 5 1/4 3 3/8</td>
<td>- - 1/2</td>
<td>6-10d</td>
<td>8-SD 10d 1/2</td>
<td>- -</td>
</tr>
<tr>
<td>ABU4MZ</td>
<td>4d</td>
<td>3 3/16 5 7 2 3/8</td>
<td>5/8</td>
<td>12-16d</td>
<td>12-SD 10d 1/2</td>
<td>- -</td>
</tr>
<tr>
<td>ABAMZ</td>
<td>4d</td>
<td>5 1/2 5 1/4 3 3/8</td>
<td>- - 1/2</td>
<td>6-10d</td>
<td>8-SD 10d 1/2</td>
<td>- -</td>
</tr>
<tr>
<td>ABU4MZ</td>
<td>4d</td>
<td>5 1/2 1 1/4 3 1/4</td>
<td>5/8</td>
<td>12-16d</td>
<td>12-SD 10d 1/2</td>
<td>- -</td>
</tr>
<tr>
<td>ABAMZ</td>
<td>4d</td>
<td>7 1/2 7 7</td>
<td>- - 1/2</td>
<td>2 3/8</td>
<td>16-16d</td>
<td>- -</td>
</tr>
<tr>
<td>ABU4MZ</td>
<td>4d</td>
<td>7 1/2 7 7</td>
<td>- - 1/2</td>
<td>2 3/8</td>
<td>16-16d</td>
<td>- -</td>
</tr>
</tbody>
</table>

1. D indicates connector is available in stainless steel. Replace Z in model number with SS when ordering.
2. Refer to current Wood Construction Connectors catalog for additional information.

**PBS Post Bases**

**Installation:**
- Embed into wet concrete up to the bottom of the 1”-2”-offset bosses. A 2” minimum slab cover is required to obtain the full load. Holes in the bottom of the struts permit for free concrete flow.
- Allow concrete to cure before installation of the post.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Dimensions (in.)</th>
<th>Post Fasteners</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBS44ADG</td>
<td>3 3/16 3 1/8 3 7/16 3 3/4 8-16d 14-SD 10d 1/2</td>
<td>2 1/2</td>
</tr>
<tr>
<td>PBS68-ADG</td>
<td>5 1/2 3 3/4 8 1/4 3 3/4 8 1/4 3 3/4 8-16d 14-SD 10d 1/2</td>
<td>2 1/2</td>
</tr>
</tbody>
</table>

1. Refer to current Wood Construction Connectors catalog for additional information.
**TA102 Inverted Installation**

Installation:
- Use all specified fasteners.
- For double 20-ft trellis, install TA102 inverted with 4 screws installed into the trellis.
- On-center spacing of SOS wood screws per designer.
- 3/8" minimum top spacing from top of ledger and handrail.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Fasteners</th>
</tr>
</thead>
<tbody>
<tr>
<td>TA102</td>
<td>3-SOS 3/8 x 1 1/2&quot;</td>
</tr>
<tr>
<td>TA102</td>
<td>4-SOS 3/8 x 1 1/2&quot;</td>
</tr>
</tbody>
</table>

**SDS Ledge Installation**

<table>
<thead>
<tr>
<th>Size (in.)</th>
<th>Model No.</th>
<th>Thread Length (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; x 3&quot;</td>
<td>SDS0312</td>
<td>2 1/2</td>
</tr>
<tr>
<td>1/4&quot; x 5&quot;</td>
<td>SDS0500</td>
<td>2 1/2</td>
</tr>
</tbody>
</table>

Installation:
- Install Simpson Strong-Tie SDS wood screws with a 3/8" hex head driver.
- SDS screws installed into 2x6 horizontal run of the deck ledger per Section RS02.2.2.1.1.

**TA Tread Angle**

Installation:
- Install Simpson Strong-Tie SDS wood screws with a 3/8" hex head driver.
- SDS screws installed into a 2x6 high-torque drill.
- A standard cut washer (provided) must be installed between the nut and the DTT2Z seat.
- Bolt holes shall be a minimum 1/2" to a maximum 1/2" larger than the bolt diameter.

**DTT2Z Deck Tension Tie**

Installation:
- DTT2Z Installed as a Lateral Connector for a Deck Guardrail Post.
- For more information on guardrail post connections, see technical bulletin T-GRDRLPST (available at www.strongtie.com).

**DDS Screws**

Installation:
- DTT2Z Installed as a Lateral Connector for a Deck-to-Deck Lateral, Fastening Connection.
- For more information on this connection, and installation instructions, see technical bulletin T-DECKLOAD (available at www.strongtie.com).
**MINIMUM BEAM SIZES AND SPANS**

<table>
<thead>
<tr>
<th>SPECIES GROUP 1</th>
<th>SPACING BETWEEN BEAMS, FT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beam size</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td>4x6” X</td>
<td>6</td>
</tr>
<tr>
<td>4x8” X</td>
<td>8</td>
</tr>
<tr>
<td>4x8” X</td>
<td>10</td>
</tr>
<tr>
<td>3x10” X</td>
<td>11</td>
</tr>
<tr>
<td>4x10” X</td>
<td>12</td>
</tr>
<tr>
<td>3x12” X</td>
<td>13</td>
</tr>
<tr>
<td>4x12” X</td>
<td>14</td>
</tr>
<tr>
<td>6x10” X</td>
<td>15</td>
</tr>
<tr>
<td>6x12” X</td>
<td>16</td>
</tr>
</tbody>
</table>

- Beams are on edge. Spans are center to center distances between posts or supports.
- Grade is No. 2 or Better: No. 2 - medium green Southern pine.
- Species Group 1: Douglas fir, larch, Southern pine.
- Species Group 2: Hemlock fir, Douglas fir, southern pine.
- Species Group 3: Western pines and cedars, redwood, spuce. Example: If the beams are 9 feet 6 inches apart and the Species is Group 2, the foot column, 3X6, up to 6 foot spans, 4X6 or 3X12 up to 7 foot spans, 4X12 or 6X6 up to 9 foot spans, 6X12 up to 11 foot spans.

**CONCRETE FOOTINGS**

The building codes in your community will be very specific about this deck component (suitably). However, here are several rules of thumb for engineering purposes:

- If possible, footings should be placed on undisturbed soil or rock. The footings must extend below frost line in your area, which ranges from 24 inches minimum to 48 inches maximum. You can find out the frost line depth in your area by phoning the National Weather Service. If this agency is not conveniently reachable, your local Building Department will know the frost line depth.
- Footings usually are placed concrete in rectangular, square, or circular shapes depending on the post connection. Most footings extend 2 to 6 feet.
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**STAKE OUT THE SITE**

Clean away all trees, shrubs, grass, big rocks, and other debris before you order material. The ground should slope away from the house slightly for adequate drainage.

**STAKE OUT THE DECK**

With wooden stakes and chalk line, square the deck to the house. By doing this, you also have created the shape of the deck with stringing.

Take your time with this task. Getting it correct at this point can save you plenty down the line. The stake-out will be used to determine all other deck dimensions as you proceed.

**STAKE OUT THE FOOTINGS**

Using the stakes again, locate the footing positions. Most posts are set back from the leading edge of the deck by 8 to 24 inches. If the footing location happens to coincide with an underground utility, you may get the utility moved, or you will have to relocate the deck.

The size and number of footings are determined by the size of the deck and its expected load. Generally, for most decks, footings are placed on 5-foot centers, front, middle, and back. If there will be lots and lots of weight on the deck, the footings can be 4 foot on-center for support. Don’t skimp. It’s better to overdo it slightly than underdo it.

When you have determined position, stake the post holes so the stakes are “on-center” within the footing area. An auger or clamshell type posthole digger can be used to dig the footing holes.

**FORMWORK**

Joists, at 2 and/or 4 foot intervals. It’s recommended that you use 16d hot-dipped galvanized nails to assemble the deck. You can also use metal connectors to attach support joints at beams. See drawings.

**DOWN WITH THE DECKING**

Once the joists are in position, the decking goes down. Make sure that the curved end grain of the wood faces downward to eliminate cupping.

Make the nailing pattern uniform. First lay a chalkline along each joist span. Drive two nails at each joist, along the line. The butt joints of the decking should line up over the joist and be centered. After you nail the first deck board, leave a 1/8- to 1/4-inch space between each board. Use 16d hot-dipped galvanized casing nails, if you are going to space between deck boards since they are about 1/8 inch thick.

If you find the deck boards are not exactly parallel, don’t try to correct all of the problem by adjusting the next board. Adjust gradually over the next two or three boards. Keep checking dimensions, based on the first board; chances of misalignment will be much less.

When you’re about 8 feet from finishing, plan how to make the last piece of decking fit flush with the skirt. Space the remaining boards to coincide with the edge of the skirt.

If in doubt, lay out the boards to fit the skirt before nailing them down. You are now ready to trim the deck to final dimensions. See the drawing at bottom far right.

**TRIMMING THE DECKING**

Check with the customer TWICE before you start the trimming procedures. Trim from the house out.

When you saw, try to keep the saw away from the skirt, unless the deck boards will overlap the skirt. A chalkline will help you see the cut line. To cap the end of the cut decking, as well as to provide an edging strip, you can install a molding piece around the edge of the deck boards.

**Joists attach to ledger with a cleat, joint hanger, or by lag screw딩**

Posts are now attached to post-seats with bolts, excepting drift pins. As the post-fastening takes place, use scrap framing lumber inside the posts.

Attach the beams to the posts. The most efficient way to is to tack-nail one beam to the outsides within a row. To do this, first attach the beam closest to the house. It must be level and at the right height. Continue to attach the rest of the beams the same way, leveling them to the first beam installed.

Once the beams are up, select a very straight 2x4 and lay it over the beams. Level it. Check the diagonal level as well. Make any adjustments, and then lag screw all the beams to the posts. Use washers and three or four lag screws per connection.

Repeat the sequence with another set of beams. Install these on the inside of the posts. Level them and fasten with tags the same way as you did the first set. Double check level.

Now, measure from a constant point on the deck to the beam cutout that the end of each set of beams. Verify his by using a chalk-line from one end to the other end to make sure all beam ends will be cut at the same point.

**INSTALLING THE JOISTS**

Joists are set on the beams. Simplify the job by installing the skirt joists first. Tongue and groove to the beams and across other joists. On the inside of the posts, they are cut down to the joist pattern (usually on 24-inch centers) if your plan calls for it. Then put down the joists. The distance from the center of the post to the next one will be 24 inches.

Start at one end of the deck and work to the opposite end. Don’t be upset if the first two joists have less space than 24 inches. If your decking pattern will be zig-zag, herringbone, or diamond, use blocking between joists. Sight down each joist and set it so the "crowns" is facing up.

The joists are nailed to the skirts and at the beams, where possible, and the blocking is nailed.

**Jacks, Beam Hanger, Double Hanger, etc.**

**Hangers for joining joists to beams are available in various specifications.**

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*Homestratosphere.com*